

without realizing its interest as a rare adventitious species in New England. I revisited the station later but was unable to find any other specimens. Diagnostic fragments of the plant have been deposited in the Herbarium of the New England Botanical Club for the record. Only one other New England specimen has been brought to my attention, viz., from Rutland, Massachusetts, coll. Mrs. Rufus B. Dodge.—RICHARD J. EATON, Lincoln, Massachusetts

THE GENUS LIATRIS

L. O. GAISER

(Continued from page 263)

10. *LIATRIS GRACILIS* Pursh. Corm small, globose, up to 3 cm. in diameter, in tall robust plants giving rise to a dense spreading fibrous root-system; stems slender to stiff and thick (up to 0.7 cm. in diameter at the base), often reddish, glabrous or more generally softly cinereous-pubescent, 2–10 dm. tall: leaves glabrous, ciliate or with few scattered hairs, punctate, short and numerous, lanceolate to linear; longest basal ones about 2 dm. long, 0.5–1 cm. wide, bluntly lanceolate, narrowed to a winged petiole with scattered cilia along the margin; other leaves reduced upwards to bracts, 1–2 cm. long and 1 mm. wide; inflorescence a simple raceme often ca. 3 dm. long, sometimes becoming paniculate and twice as long; heads on short filiform, villous pedicels, at least as long as and often longer than the heads, divaricate and frequently at right angles to the pubescent rachis, often, in paniculate inflorescences, becoming slender bracteolate peduncles 15 cm. long: heads the smallest of any species of the genus, 7–9 mm. long and about as wide when the flowers are open, of 4–6 flowers; phyllaries rather thin, oblong, obtuse, rarely tending to become acute, sometimes pubescent, ciliate on the margin, loosely erect: outer ones short, ovate, 2 mm. long and ca. 1 mm. wide; inner ones 5.5 mm. long and ca. 1.5 mm. wide; corolla from deep lavender to violet, 5–7 mm. long, densely pilose within the upper part of the tube and lower part of the throat; pappus hardly as long as the corolla, ca. 5 mm., short-barbellate; achene ca. 3 mm. long—Fl. Amer. Sept. 508 (1814); Gray, Synop. Fl. i². 111 (1884). *Laciniaria gracilis* O. Ktze., Rev. Gen. 1349 (1891), not, sensu Small, Man. S. E. Fl. 1334 (1933). *Liatris pauciflosculosa* Nutt. Jour. Acad. Phil. vii. 71 (1834). *L. lanceolata* Bertol. Misc. Bot. v. 11, t. 3 (1846). *Laciniaria laxa* Small, Bull. Torr. Bot. Club, xxv. 472 (1898) and Man. S. E. Fl. 1334 (1933). *Liatris laxa* K. Sch. in Just, Jahresb. xxvi¹. 378 (1900).

South Carolina, Georgia, Alabama and especially Florida.—
 SOUTH CAROLINA. BEAUFORT Co.: dry woods, St. Helena Isl., Sept. 1882, *A. Cuthbert* (F); St. Helena Isl., Sept. 1892, *A. Cuthbert* (NY); dry barrens, St. Helena Isl., Sept. 1894, *A. Cuthbert* (F); flat pine woods, St. Helena Isl., Oct. 1902, *A. Cuthbert* ((NY 874) F); Oct. 1903, *A. Cuthbert* (F). GEORGIA. Without stated locality: *Nuttall* (P), *L. Conte* (P), 1844, *Dr. Harden* (P); 1831, *Gates* (NY). Co. undetermined: Atlantic & Gulf Rwy., *Chapman* (NY). GLYNN Co.: sandy pine land, Brunswick, Oct. 10, 1912, *F. W. Pennell*, 4837 (P). BERRIEN Co.: rather dry flat pine barrens, ca. 1½ mis. s. of Tifton, Sept. 26, 1902, *R. M. Harper*, 1683 (G, NY, US). THOMAS Co.: Thomasville, Oct. 16, 1903, *Taylor* (G). DECATUR Co.: Bainbridge, 1875, *A. H. Curtiss* (US). FLORIDA. Without stated locality: *Chapman* (G, NY, P, US), *Chapman*, 52 (US), *A. W. Chapman*, ex *Herb. G. Thurber* (G), *A. P. Garber* (US), *Leavenworth* (G, NY), *Rugel* (US). Co. UNDETERMINED: southern Florida, *Chapman* (NY); pine barrens, *Chapman*, ex *Herb. J. A. Lowell* (G); Fort Dallas, *J. G. C.* (NY). DUVAL Co.: dry pine barrens, Jacksonville, Oct. 25, 1894, *A. H. Curtiss*, 5312 (G, NY, US); dry pine barrens, near Jacksonville, Oct., *A. H. Curtiss*, 1181 (G, NY, P, Q, US); Jacksonville, Oct. 25, 1893, *A. H. Curtiss*, 4446 (NY, US); Jacksonville, Nov. 1891, *Herb. W. G. Farlow* (G); Jacksonville, Oct. 18, 1898, *A. H. Curtiss* (G); dry pine barrens, near Jacksonville, Oct. 18, 1898, *A. H. Curtiss*, 6290 (NC, F); Jacksonville, Nov. 14, 1901, *J. K. Small & G. V. Nash*, 369 (NY). COLUMBIA Co.: dry open woods, Camp Oleno, Oct. 1, 1939, *Watson & Murrill* (F). HAMILTON Co.: dry woods on Suwannee R., White Springs, Sept. 30, 1941, *E. West & Miss L. Arnold* (F). JEFFERSON Co.: high pine-oak woods, n. of Monticello, Oct. 7, 1940, *W. A. Murrill* (F). GADSDEN Co.: without locality, Oct. 24, 1880, *C. Mohr* (US); open pinelands, w. part of county, Aug. 30, 1936, *H. Foster* 115 (F). JACKSON Co.: Cypress, Oct. 21, 1941, *R. A. Knight* (F). CALHOUN Co.: without locality, Oct. 25, 1944, *R. A. Knight* (F). LIBERTY Co.: sandy pine barrens, Aspalaga, Oct. 1897, *Biltmore Herb.*, 577a (G, NY, ND). FRANKLIN Co.: sandy pine barrens, Apalachicola, Oct. 3, 1882, *Biltmore Herb.*, 577b (G, NY, NC, Q, US); dry pine barrens; Apalachicola, *B. F. Saurman* (P); Apalachicola, 1867, *B. F. Saurman* (P). WASHINGTON Co.: Chipley, Oct. 13, 1943, *R. A. Knight* (F). BAY Co.: dry sandy ground, Lynn Haven, Oct. 14, 1921, *C. Billington* (US). OKALOOSA Co.: Crestview, Oct. 23, 1939, *R. A. Knight* (F); Crestview, Oct. 9, 1939, *Mrs. G. Barrow* (F). SANTA ROSA Co.: sandy pine land, Milligan, Sept. 10, 1912, *F. W. Pennell* (NY, US). SAINT JOHNS Co.: St. Augustine, *M. C. Reynolds* (NY); pine barrens, *M. C. Reynolds* (US). PUTNAM Co.: flatwoods, S. E. Adm. Bldg., Welaka, Oct. 26, 1944, *A. M. Laessle* (F).

BRADFORD Co.: Starke, Nov. 1893, *Miss G. Gilbert* (G). UNION Co.: on dry ground near highway n. of Worthington Springs, Oct. 20, 1945, *H. H. Hume* (F). ALACHUA Co.: high open land, Warren's Cave, Gainesville, Oct. 5, 1927, *G. F. Weber & E. West* (F); roadside, Archer Rd., Gainesville, Oct. 31, 1931, *Miss L. Arnold* (F); upper slopes, Devil's Millhopper, Gainesville, Oct. 23, 1932, *Miss L. Arnold* (F). TAYLOR Co.: 9 mis. s. of Perry, Oct. 8, 1940, *W. A. Murrill* (F). FLAGLER Co.: roadside just e. of Bunnell, Oct. 10, 1940, *E. West and Miss L. Arnold* (F). MARION Co.: dry woods, Belleview, Sept. 15, 1927, *O. F. Burger & E. West* (F). VOLUSIA Co.: low sandy ground, De Land road, Nov. 6, 1944, *Mrs. H. T. Butts* (OA). SEMINOLE Co.: high pineland, Altamonte Springs, Oct. 4, 1928, *E. West* (F). ORANGE Co.: Wekiwa Springs, Dec. 5, 1929, *H. N. Moldenke*, 1920 (NY); Wekiwa Springs, Sept. 25, 1929, *H. O'Neill* (US, F); high pineland, Orlando, Sept. 24, 1927, *O. F. Burger & E. West* (F); high pineland, Zellwood, Sept. 24, 1927, *O. F. Burger & E. West* (F). LAKE Co.: 4 mis. s. w. of Astor Park, Oct. 13, 1940, *W. A. Murrill* (F). SUMTER Co.: 3 mis. s. of St. Catherines, Oct. 14, 1943, *W. B. Tisdale* (F). CITRUS Co.: Inverness, *M. A. Noble* (P); sandy dry oak-pine woods, 1 mi. s. of Floral City, Oct. 16, 1945, *H. H. Hume* (F). HERNANDO Co.: vic. of Brooksville, Sept. 21, Oct. 19, 22, 1919, *R. N. Jones* (US). BREVARD Co.: low pine barrens, Okeechobee, Sept. 26, 1903, *A. Fredholm*, 6027 (G); scrub oakland, Okeechobee region, Oct. 20, 1903, *A. Fredholm*, 6148 (G). HILLSBOROUGH Co.: Tampa, Sept. 1877, *A. P. Garber* (P); dry sand, Oct. 13, 1904, *A. Fredholm*, 6424 (G); in a high hammock, Riverview, Oct. 8, 1930, *F. S. Blanton*, 6794 (US); flatwoods n. of Riverview, Oct. 19, 1945, *L. O. Gaiser, Mrs. H. T. Butts, Miss L. Arnold*, Aug. 19, 1945 (F). PINELLAS Co.: Tarpon Springs, Aug. 1894, *C. S. Williamson* (P); sandy open or light wooded space, St. Petersburg, Sept. 17, 1932, *G. M. Hocking* (F). INDIAN RIVER Co.: between Fellsmere and Sebastian, Aug. 13, 1925, *R. M. Harper*, 53 (US). OKEECHOBEE Co.: pineland, Okeechobee, Oct. 12, 1941, *J. H. Davis* (F). MANATEE Co.: Tampa Bay, *Herb. G. Thurber* (G); Bradentown, Sept. 29, 1900, *S. M. Tracy* 7105 (G, NY, US); Manatee, 1889, *J. H. Simpson* (US); flatwoods, at Palma Sola, Bradentown, Oct. 10, 1920, *A. Cuthbert* (F); flatwoods, n. of Parrish, Aug. 19, 1945, *L. O. Gaiser, Mrs. H. T. Butts, Miss L. Arnold* (F). SARASOTA Co.: air field in flatwoods, Venice, Aug. 19, 1945, *L. O. Gaiser, Mrs. H. T. Butts, Miss L. Arnold* (F). HENDRY Co.: wet pine-lands, Indian Reservation, Jan. 15, 1942, *J. H. Davis* (F). LEE Co.: in pineland, vicinity of Fort Myers, Oct. 29, 1916, *Miss J. P. Standley*, 415 (G, P, US); pine flatwoods, 5 mis. s. of Ft. Myers, Oct. 20, 1942, *J. H. Davis* (F). BROWARD Co.: pinelands, Fort Lauderdale, Nov. 19–25, 1903, *J. K. Small & J. J. Carter*,

1470 (NY); Fort Lauderdale, Nov. 1903, *J. K. Small & J. J. Carter*, 1069 (P). DADE Co.: Cape Florida, Mar. 14, 1892, *Mrs. J. H. Simpson*, 537 (G (NY, TYPE of *Lacinaria laxa* Small)); pinelands, w. of Silver Palm, Nov. 21, 1916, *J. K. Small*, 7982 (NY); pinelands, w. of Silver Palm, Nov. 21, 1916, *J. K. Small*, 7974 (G, NY, F); pinelands w. of Rockdale, Nov. 18, 1916, *J. K. Small*, 7899 (NY); pineland prairie, Tamiami Trail, w. of Miami, Dec. 19, 1919, *J. K. Small, N. L. Britton, & M. De Winkeler*, 9372 (NY); pinelands, near Camp Jackson ca. 35 mis. s. w. of Miami, Jan. 7-10, 1909, *J. K. Small & J. J. Carter*, 3043 (NY); pinelands, w. of Miami, Apr. 7, 1904, *N. L. Britton*, 475 (NY); pinelands, between Cocoanut Grove and Cutler, Oct. 31-Nov. 4, 1903, *J. K. Small & J. J. Carter*, 719 (NY, P); pinelands, between Cocoanut Grove and Cutler, Oct. 31-Nov. 4, 1903, *J. K. Small & J. J. Carter*, 753 (NY); Buena Vista, Jan. 21, 1930, *H. N. Moldenke*, 4850 (NY); s. of Miami, Mar. 27, 1930, *H. N. Moldenke*, 5858 (NY); e. of Naranja, Jan. 14, 1909, *J. K. Small & J. J. Carter* (P). ALABAMA. Without stated locality: *Gates* (G, NY, P, B, isotypes of *L. lanceolata* Bert.), *C. W. Short* (P), *Herb. G. Thurber* (G), *Herb. Torrey* (NY). Co. undetermined: pine woods, *Buckley* (NY). COVINGTON Co.: Blue Springs, near McRae, Sept. 13, 1912, *F. W. Pennell*, 4615 (P). BALDWIN Co.: Gateswood, Oct. 31, 1903, *S. M. Tracy*, 8559 (G, NY, ND, T, US). MOBILE Co.: sandy dry pine woods, Mobile, Oct. 1878, *C. Mohr* (US); dry sandy pine barrens, Mobile, Oct. 1880, *C. Mohr* (US); Mobile, 1878, *C. Mohr* (US); mixed wood, s. of Mobile, Sept. 24, 1912, *H. H. Bartlett*, 3226 (G, US); 3217, in part (US); Whistler, Oct. 10, 1884, *C. Mohr* (US); Spring Hill, Aug. 3, 1897, *B. F. Bush*, 150 (NY); Spring Hill, Sept. 28, 1878, *C. Mohr* (NY, US), Oct. 1890 (NY), Oct. 20 (US); hillside, Spring Hill, Sept. 1919, *E. W. Graves*, 1324 (US); pine woods, w. of Spring Hill, Aug. 1918, *E. W. Graves*, 594 (US); pine ridges, Sept. 28, 1879, *C. Mohr* (NY).

It was possible to compare a photograph of the type specimen of *L. gracilis* Pursh, obtained by Mr. Weatherby at Kew, and two specimens at the Philadelphia Academy of Science, of Gates from Alabama, one of which is probably the co-type, if not the type, of *L. pauciflosculosa* Nutt. While the phyllaries are slightly acute in one Gates specimen they are obtuse in the other and with their filiform, divaricate pedicels, closely resemble the Pursh specimen, except for the fact that Pursh described his plant as glabrous while Nuttall described the stem as puberulent. Since such a surface character alone has not been of diacritical significance in this genus, and there is a wide variation in the degree of

pubescence in this generally ciliate species the two names seem synonymous, as does also *L. lanceolata* Bertol. of which isotypes were seen in four herbaria (G, NY, P, B).

Careful examination of the plant of J. H. Simpson, no. 537, from Cape Florida (NY) which was described by Small (Bull. Torr. Bot. Club, xxv. 472 (1898)) as *Lacinaria laxa* showed no decisive characters by which it could be separated from *L. gracilis*.

Abounding chiefly in Florida, though occurring also in Southern Georgia and Alabama, *L. gracilis* is distinguishable from *L. graminifolia* var. *elegantula* which overlaps its northern range, by its smaller heads, flowers and achenes.

11. *LIATRIS REGIMONTIS* (Small) K. Sch. Corm globose, 1.5–2 cm. in diameter; stem slender, glabrous, striate, 4–7 dm. high; leaves few, linear, mostly glabrous with marginal cilia, but sometimes with hairs on upper surface as well as beneath; basal ones 6–10 cm. long and ca. 5 mm. wide having a few cilia at base; inflorescence long, covering one half to three quarters of the length of the stem, with numerous sessile or peduncled heads forming a spike or slightly branched panicle: heads 6–12-flowered, ca. 10 mm. long, cylindrical but with the phyllaries slightly spreading rather than appressed, the mid-vein showing rather distinctly and forming a rather rigid keel; outer phyllaries ovate, mucronate-tipped, and with entire margins, the inner ovate-lanceolate with somewhat membranous margins; corolla 7 mm. long with appressed hairs at the base of the throat and upper part of the tube, sometimes appearing up to the base of the lobes; pappus barbellate, 3.5–4 mm. long; achene 3–3.5 mm. long.—Just, Bot. Jahresb. xxvi. pt. 1, 378 (1900). *Lacinaria regimontis* Small, Bull. Torr. Bot. Club, xxv. 473 (1898). *Liatris carinata* Coker, Pl. Life of Hartsville, 108 (1912). *Laciniaria carinata* Small, Fl. S. E. U. S. 1174 (1903).

Eastward from the mountains in Virginia, North and South Carolina.—VIRGINIA. WYTHE Co.: Wytheville, *H. Shriver*, 9874 (P). NORTH CAROLINA. FORSYTH Co.: Winston Salem, Sept. 22, 1927, *E. T. Wherry & F. W. Pennell*, 14348 (P). WAKE Co.: Raleigh, Sept. 6, 1908, *W. W. Eggleston*, 4052 (G, US); BURKE Co.: Bridgewater, Sept. 20, 1927, *E. T. Wherry & F. W. Pennell*, 14297 (P); WAYNE Co.: sand ridge, near Goldsboro, Sept. 3, 1938, *R. K. Godfrey*, 6562 (G, P). MOORE Co.: Pinehurst, Aug.–Sept. 1897, *O. Katzenstein* (G); sandy places, Sept. 1, 1940, *P. O. Schallert* (G). CLEVELAND Co.: King's Mt. and vicinity (alt. 600'–1300'), Aug. 27–30, 1894, *J. K. Small* (NY, type); King's Mt. (alt. 2600'–3000'), Sept. 10, 1908, *W. W. Eggleston*, 4073 (NY, US); woodland, near King's Mt., Oct. 7,

1902, *Biltmore Herb.*, 15006 (NY). SCOTLAND Co.: 10 mis. s. of Aberdeen, Oct. 12, 1938, *R. K. Godfrey*, 6941 (G); sandhill, 10 mis. n. of Laurensburg, July 14, 1938, *R. K. Godfrey*, 5045 (G). SOUTH CAROLINA. Co. undetermined: dry soil, Santee Canal, Oct., *H. W. Ravenel* (G). CHESTERFIELD Co.: 1 mi. w. of McBee, Sept. 7, 1939, *R. K. Godfrey*, 8055 (G, NY). ANDERSON Co.: dry slopes, Anderson, Aug. 10, 1912, *J. Davis* (NY); dry pine woods, Anderson, Aug. 15, 1919, *J. Davis*, 7794 (US). OCOONEE Co.: without stated locality, *A. P. Anderson*, Sept. 9, 1898, 1529, Sept. 11, 1898, 1546 (US); DARLINGTON Co.: sandy pine woods, Society Hill (common), *M. A. Curtis* (G); low pine lands, Society Hill (1 stem to left), Sept. 8, 1904, *Biltmore Herb.*, 14935a (NY). KERSHAW Co.: 3 mis. w. of Bethune, Sept. 7, 1939, *R. K. Godfrey*, 8014 (G, NY). SUMTER Co.: local, Sumter, Oct. 21, 1913, *Herb. E. B. Bartram*, 3248 (P). LEXINGTON Co.: 6 mis. s. of Columbia, Aug. 7, 1939, *R. K. Godfrey & R. M. Tryon*, 1247 (G, NY). EDGEFIELD Co.: sandy ridges, Sept. 22, 1883, *J. D. Smith*, 34 (US). GEORGETOWN Co.: pine barren clearing, 5 mis. s. of Andrews, Sept. 13, 1939, *R. K. Godfrey*, 8190 (G, NY); sandy pine woods, Oct. 12, 1934, *F. G. Tarbox Jr.*, 175-2, 175-3 (NY). AIKEN Co.: Aiken, Sept. 12-15, 1909, *W. W. Eggleston*, 5047 (G, NY). BERKELEY Co.: sandy soil, Monk's Corner, Oct. 14, 1912, *F. W. Pennell*, 4888 (NY); near Monk's Corner, Sept. 29, 1856, *L. R. Gibbs* (NY). ORANGEBURG Co.: Eutauville, Sept. 6-11, 1909, *W. W. Eggleston*, 4952, 4989 (NY), 4966 (NY, P), 5008 (G, NY). BEAUFORT Co.: dry sandy bluff, Sept. 5, 1904, *Biltmore Herb.*, 14935b (NY). GEORGIA. Without stated locality: *Croom* (G).

This species is found in North and South Carolina, east of the mountains, where also the varieties *typica* and *dubia* of *L. graminifolia* occur. It is best distinguished from those varieties, having leaves with prominent hairs along the petioles or on the surfaces and turbinate heads with thin, ciliolate-margined phyllaries, by almost glabrous leaves and almost entire-margined, somewhat keeled phyllaries, the outer appearing revolute.

Laciniaria carinata described by Small, l. c., from the same general region, was included in Small, *Man. S. E. Fl.* 1333 (1933) under *Laciniaria secunda* (Ell.) Small. Examination of the specimens bearing this name in the herbarium (NY) shows a closer relationship to *L. regimontis* in the size of the heads and corollatubes (ca. 7 mm. long in *regimontis* and 10-12 mm. long in *secunda*) and in the lack of the puberulent stem of *L. secunda*. The phyllaries are perhaps slightly more membranous but if not "thick lax-tipped", as *regimontis* was described by Small, are

nevertheless spreading and show the midvein projecting at the tip. It is here included in the synonymy of *L. regimontis*.

The corolla-tube in all these specimens is pilose at the base of the throat, above the attachment of the filaments, and so shows relationship to the species of the *Graminifoliae* series rather than to *L. microcephala*, which has a smooth corolla-tube and small cylindrical heads of appressed bracts. When found in a young inflorescence stage it casually resembles and could be confused with this species.

SERIES IV. PAUCIFLORAE. Herbs of one or two stems, glabrous or short-pubescent, with numerous short, linear to linear-lanceolate leaves; inflorescence spicate, racemose or simply paniculate, usually erect (often reclining in *L. secunda*), of slender long cylindrical compact heads 1–2 cm. long, usually 3–6-flowered, with appressed glabrous, thin linear-acuminate to -acute phyllaries; corolla-tube 10–12 mm. long, with only very few hairs within and few scattered ones at the base without; achene ca. 4 mm. long.—From sandy pinelands of the coastal plain from North Carolina to Florida, Alabama and Louisiana.

- a. Slender sessile crowded heads densely erect, giving a narrow stiff spicate inflorescence, glabrous or short-pubescent; corolla-tube with slight pilosity within the base of the throat. 12. *L. Chapmanii*.
- a. Slender short-pedicellate heads less crowded in loose racemes or simple panicles; corolla-tube with only a few scattered hairs within and outside at the base of the tube. . . . b.
- b. Stem and leaves glabrous; inflorescence erect, racemose or paniculate. 13. *L. pauciflora*.
- b. Stem short-pubescent; leaves pubescent, or ciliate toward the base; inflorescence racemose, with heads frequently secund. 14. *L. secunda*.

12. LIATRIS CHAPMANII Torr. & Gray. Corm rounded or ovoid up to 2 cm. in diameter: stem usually single, stiff, minutely cinereous-pubescent or glabrous, very leafy, 3–7.5 dm. tall; leaves very numerous, linear-lanceolate, inconspicuously punctate, finely pubescent or glabrous, lower ones ca. 1.5 dm. long, and 5–10 mm. wide, forming a rosette at the base of the stem; upper leaves narrowed below the middle into a slender margined petiole, gradually reduced, 1.5 cm. long at the base of the spike; inflorescence a very dense, narrow spike, 1–3.5 dm. long, of slender, 3–5-flowered, cylindrical, nearly sessile heads, 1–1.8 cm. long, erect and generally closely appressed to the rachis; phyllaries oblong-lanceolate, acute or mucronulate, glabrous and with narrow scarious margins, sometimes purple; corolla phlox-purple, rarely white, ca. 12 mm. long, with very slight pilosity, if any, within the tube at the base of the throat; achene 4–5 mm. long;

pappus 9–11 mm. long and barbellulate, with barbellae about equal to or twice the diameter of the seta.—Fl. N. Am. ii. 502 (1843); Chapman, Fl. So. U. S. 191 (1860); Gray, Synopt. Fl. i². 112 (1884). *Laciniaria Chapmanii* O. Ktze. Rev. Gen. i. 349 (1891). *Laciniaria Deamiae* Lunell, Amer. Midl. Nat. ii. 163 (1912). *Lacinaria Chapmanii* var. *longifolia* Nash, Bull. Torr. Bot. Club, xxiii. 106 (1896).

Georgia and Florida.—GEORGIA. DECATUR Co.: without locality, Sept. 15, 1880, *Dr. E. A. Smith* (NY). FLORIDA. Without stated locality: *Chapman, ex Herb. C. Mohr* (US); *Curtiss, ex Herb. U. S. Dept. Agr.* (US); *ex Herb. Park Davis Co.*, 3496 (US). Co. UNDETERMINED: sandhills, *A. W. Chapman* (G, (NY type)); on arid sandhills, *Chapman* (G); southern Florida, *A. W. Chapman* (NY, US). LEON Co.: Bellair, Sept. 3, 1895, *G. V. Nash*, 2547 (G, NY, US, ND). GADSDEN Co.: dry sandy pine ridges, near Bristol & Quincy, Oct. 24, 1895, *C. Mohr* (US); on arid sandhills, Sept., *Chapman* (G); open pinelands, western part of county, Aug. 30, 1936, *H. Foster*, 113 (F). FRANKLIN Co.: dry sandy ridges, near Apalachicola, July 12, 1895, *ex Biltmore Herb.*, 4114a (G, NY, US, ND); dry pine barrens, near Apalachicola, Oct. *A. H. Curtiss*, 5441 (NY); Apalachicola, Oct. *Curtiss*, (NY); dry pine barrens, near Apalachicola, Oct. 1888, *A. H. Curtiss*, 1182 ((G, US, without date) NY, ND)); St. Vincent Island, Oct. 30, 1910, *W. L. McAtee*, 1730, (US); St. Vincent Island, Oct. 30, 1910, *W. L. McAtee*, 1743 (US). OKALOOSA Co.: East Pass, *S. M. Tracy*, 6362 (G, US, NC). ESCAMBIA Co.: barren scrubs near Pensacola, Sept. 26, 1901, *A. H. Curtiss*, 6918 (G, NY, US, Q); high dry pine barrens, w. side of Escambia Bay, Sept. 20, 1910, *R. M. Harper*, 88 (G, NY, US). PUTNAM Co.: with low turkey-oak, along n. boundary, Welaka, April 28, 1940, *A. M. Laessle* (F). VOLUSIA Co.: dry scrub, Tomoka Ave., near Ormond, Sept. 24, 1944, *Mrs. H. T. Butts* (OA); flatwoods, s. of Seville, Sept. 17, 1943, *G. West & Miss L. Arnold* (F). ORANGE Co.: flatwoods, Orlando, Oct. 18, 1929, *E. West & De Vane* (F); sandhills, Windermere, Sept. 19, 1929, *F. Vasku* (F). HERNANDO Co.: Choocochattee Hammock, near Brooksville, Aug. 26, 1922, *J. K. Small, J. W. Small & J. B. DeWinkeler*, 10604 (NY, F). BREVARD Co.: Okeechobee region, Aug. 13, 1903, *A. Fredholm*, 5962 (G). HILLSBOROUGH Co.: Tampa, Aug. 24, 1895, *G. V. Nash*, 2473 (G (NY, type of *Lacinaria Chapmanii* var. *longifolia* Nash) US, ND, F). PINELLAS Co.: sandy waste, near Veteran City, 8 mis. w. of St. Petersburg, Sept. 29, 1907, *Mrs. C. C. Deam*, 2804 (G, NY, US, I, cotypes of *Laciniaria Deamiae* Lunnell). HIGHLANDS Co.: sandhills, near De Soto city, Aug. 31, 1922, *J. K. Small, J. W. Small & J. B. DeWinkeler*, 10683 (G, NY); Avon Park, Sept. 5, 1934, *J. K. Small, E. West, J. B. McFarlin* (F). MANATEE Co.: (albino) high bank of Mana-

tee River, Sept. 17, 1916, *A. Cuthbert* (F); high ridges, Bradentown, Sept. 16, 1916, *A. Cuthbert* (F); high bank of Manatee River, near Palma Sola, Sept. 16, 1916, *A. Cuthbert* (F); sandhills along Manatee River, Bradentown, Sept. 17, 1916, *A. Cuthbert* (F). SAINT LUCIE Co.: low dune, 8 mis. s. of Fort Pierce, Oct. 4, 1941, *E. Kurz* (F). LEE Co.: pinelands, Deering Reservation, Cutler, July 20, 1924, *J. K. Small, J. W. Small & J. B. DeWinkeler*, 11538 (G, NY). COLLIER Co.: Cypress Head, s. of Naples, Aug. 29, 1922, *J. K. Small, J. W. Small & J. B. DeWinkeler*, 10619 (NY); in *Ceratiola* scrub, Naples, Oct. 17, 1941, *J. H. Davis* (F). DADE Co.: in sandy pineland, Buena Vista, Jan. 21, 1930, *H. N. Moldenke*, 483a (NY); in dry sandy pineland, Buena Vista, Miami, Mar. 4, 1930, *H. N. Moldenke*, 6540 (NY); in pinelands, between Cocoanut Grove & Cutler, Oct. 31–Nov. 4, 1903, *J. K. Small & J. J. Carter*, 710 (NY); Miami, Sept. 1, 1939, *E. West* (F); in sand, Homestead, Sept. 7, 1928, *G. F. Weber* (F).

L. Chapmanii is to be distinguished from *L. pauciflora* Pursh, also occurring in Florida, by its stiffer, narrow spike of crowded, erect, almost sessile heads rather than the usually pedicellate ones in an erect, simple panicle or raceme characteristic of that species. No distinctive characters could be found in the type of *Laciniaria Deamiae* Lunell to differentiate it from this species, nor did the length of basal leaves seem significant enough for varietal recognition of the Nash specimen from Tampa.

13. LIATRIS PAUCIFLORA Pursh. Corm small, globose, 1–2 cm. in diameter: stem generally single, erect but slender, glabrous, striate, leafy, 2–5 dm. tall: leaves narrow, inconspicuously punctate; basal ones not abundant, glabrous with a few cilia on the petiole, 7–10 cm. long, reduced upwards to 1 cm. long and 1 mm. wide at the base of the inflorescence: this 10–25 cm. long, a loose raceme or simple panicle: heads on very slender pedicels 3–5 cm. long, 3–6-flowered; corollas projecting well beyond the tips of the involucre; phyllaries glabrous, ovate-lanceolate with acute to acuminate tips; corolla phlox-purple, 11–12 mm. long, with a few hairs scattered over the entire inner surface and outer base of the tube; achene 4–5 mm. long and sharply pointed; pappus 9–11 mm. long, with short barbellae about equal to or twice the diameter of the seta.—Fl. Am. Sept. ii. 510 (1814); DC. Prod. v. 131 (1838); Gray, Synopt. Fl. i². 112 (1884), in part. *Laciniaria pauciflora* O. Ktze. Rev. Gen. i. 349 (1891).

Mostly northern Florida.—FLORIDA. Co. UNDETERMINED: east Florida, *Lt. Alden* (NY); dry sand, high pineland, *Dr. Leavenworth* (NY). HAMILTON Co.: dry woods, on Suwannee R. White Springs, Sept. 30, 1941, *E. West & Miss L. Arnold* (F).

SUWANNEE Co.: dry pine barrens, near Live Oak, Sept. 12, 1901, *A. H. Curtiss*, 6896 (G, NY, US, Q). WALTON Co.: dry pine barrens, between Freeport & Portland, Sept. 23, 1910, *R. M. Harper*, 90 (US right plant). PUTNAM Co.: just n. of Orange Springs, Sept. 23, 1939, *Watson & Murrill* (F). ALACHUA Co.: blackjack ridge, w. of Archer, Aug. 25, 1922, *J. K. Small, J. W. Small & J. B. DeWinkeler*, 10585 (G, NY); sandy open soil, Gainesville, Aug. 31, 1927, *O. F. Burger* (F); dry oak woods, Rochelle, Sept. 5, 1927, *E. West* (F). DIXIE Co.: pineland, 10 mis. w. of Shamrock, Aug. 22, 1937, *Pasture Survey* (F). MARION Co.: high pine woods, Belleview, Sept. 15, 1927, *O. F. Burger & E. West* (F). LEVY Co.: Bronson, Sept. 9, 1936, *Pasture Survey* (F). ORANGE Co.: Clarcona, Jan. 20, 1900, *Miss M. Meislahn*, 148a (US); Clarcona, Sept. 19, 1889, *Miss M. Meislahn*, 39 (US); Clarcona, Dec. 20, 1899, *Miss M. Meislahn*, 138a (US). HERNANDO Co.: dry pineland, near Weekiwachee Spring, Sept. 4, 1937, *Mrs. M. F. Baker* (F). LAKE Co.: vicinity of Eustis, Aug. 16-25, 1894, *G. V. Nash*, 1711 (G, NY, US, ND). HILLSBOROUGH Co.: low pineland, 12 mis. n. of Tampa, Sept. 15, 1930, *F. S. Blanton & H. O'Neill*, 6639 (US); Tampa Bay, ex Herb. *G. Thurber* (G); Tampa Bay, Oct. 1877, *A. P. Garber* (US (P, left plant)); sandhill, Hillsborough (plant to right), Sept. 17, 1904, *A. Fredholm*, 6392 (G).

For discussion see the next species.

14. LIATRIS SECUNDA Ell. Corm small and globose, 1-2 cm. in diameter; stem usually one, slender, not stiff, puberulent, frequently reclining and 3-5 dm. in length; leaves not abundant, lanceolate, inconspicuously punctate, ciliate along the margin and towards the base; basal ones lanceolate, 7-10 cm. long, 5-8 mm. wide; upper ones reducing in length to 1 cm. and in width to 2 mm. wide: inflorescence a loose terminal raceme 1.5-2 dm. long with 3-6-flowered heads ca. 1.5 cm. long, borne single on peduncles 2-3 cm. long, frequently secund if plant reclining; phyllaries oblong-lanceolate, acute, sometimes acuminate, glabrous but finely ciliolate along the margin; corolla phlox-purple, very slender, tubular, 11-12 mm. long, with a few hairs inside the full length of the tube and sometimes with few scattered hairs on outside at base of the tube; achene ca. 4 mm. long; pappus 8-9 mm. long, barbellulate, barbellae about three times the diameter of the seta.—Sk. ii. 278 (1822(?)); Torr. & Gray, *Fl. N. Am.* ii. 71 (1841); Chapman, *Fl. So. U. S.* 191 (1860). *Lacinaria secunda* (Ell.) Small *Man. S. E. Fl.* 1331 (1933).

From the southern coastal plain region of North Carolina through South Carolina, Georgia, and central and western Florida, to Alabama and Louisiana.—NORTH CAROLINA. Without stated locality: ex *Herb. Chapman* (NY). NEW HAN-

OVER Co.: dry sand barrens, Wilmington, Oct. 2, 1908, *E. B. Bartram* (NY); dry sand, Wilmington, Oct. 4, 1908, Oct. 3, 1909, *E. B. Bartram* (P); Wilmington, Aug. 1842, *C. S. Williamson* (P); near Wilmington, Oct. 1867, *W. M. Canby* (NY, P, US); 3 mis. s. of Wilmington, July 25, 1922, *L. F. Randolph & F. Randolph*, 1023 (G); Wilmington, 1885, *G. McCarthy* (US); Wilmington, 1880, Sept. 22, 1882, *T. F. Wood* (US); Greenfield Lake, at Wilmington, Aug. 7, 1938, *R. K. Godfrey & B. W. Wells*, 5914, (G). BRUNSWICK Co.: in coarse sand of long-leaf pine barren, 10 mis. n. of Southport, Sept. 12, 1941, *R. K. Godfrey*, 1189 (G, NY). SOUTH CAROLINA. Without stated locality: *Gibbes*, (G). CHESTERFIELD Co.: among scrub-oak & long-leaf pine, 1 mi. w. of McBee, Sept. 7, 1939, *R. K. Godfrey*, 8084 (G, NY, P). DARLINGTON Co.: Society Hill, *M. A. Curtiss* (G); sand hills, across Blast Creek, Hartsville (one plant), Aug. 22, 1908, *W. C. Coker* (NY). LEXINGTON Co.: sandy burned clearing, 14 mis. s. of Columbia, Aug. 7, 1939, *R. K. Godfrey & R. M. Tyron*, 1309 (G, NY); sandy pine woods, near Columbia, Sept. 1889, *Miss Crawford* (US); 2 mis. n. e. of Columbia, Sept. 25, 1883, *J. D. Smith*, 32 (US). EDGEFIELD Co.: sandy blackjack-pine ridges, Sept. 22, 1883, *J. D. Smith*, 31 (G without no., US). GEORGETOWN Co.: in swamp, near Georgetown, Aug. 1935, *W. Rhoades* (G); Georgetown, Sept. 9, 1933, *F. G. Tarbox*, 710 (NY); pine barren clearing, 5 mis. s. of Georgetown, Sept. 9, 1939, *R. K. Godfrey*, 8123 (G, NY, P). AIKEN Co.: (albino) Aiken, Sept. 12-15, 1909, *W. W. Eggleston*, 5044 (G, NY, US, P); Aiken, Sept. 1869, *H. W. Ravenel* (US). GEORGIA. Without stated locality: *ex Herb. Boston Soc. Nat. Hist.* (G). RICHMOND Co.: barrens, Augusta, Sept. 1897, *A. Cuthbert* (NY, F); sand hills, Augusta, *A. Cuthbert*, Sept. 29, 1898, 310 (NY), Sept. 10, 1903 (NY), Sept. 8, 1902 (US); sand hills, sterile ridges, Augusta, Sept. 4, 1902, *A. Cuthbert*, 785 (F); sand hills, no. of Augusta, Oct. 16, 1937, *J. H. Pyron & R. McVaugh*, 1866 (US); Augusta, *G. McCarthy*, Aug. 1888 (NY, ND), Sept. 20, 1888 (US); Augusta, 1849, *S. T. Olney* (G); Augusta, *S. T. Olney* (G); about Augusta, *S. T. Olney & J. Metcalf* (NY); BURKE Co.: without stated locality, Sept. 10, 1897, *H. Hopkins*, 39 (NY). WAYNE Co.: dry sandy ridge between Doctortown and Jesup, Sept. 14, 1903, *R. M. Harper*, 1997 (G, NY, US). FLORIDA. WALTON Co.: between Freeport & Portland, Sept. 23, 1910, *R. M. Harper*, 90 ((G, NY (US, two plants to the left)). OKALOOSA Co.: East Pass, Aug. 31, 1899, *S. M. Tracy*, 6362 (G, NY, ND, NC). SANTA ROSA Co.: dry sandy pineland, Milton, Sept. 9, 1912, *F. W. Pennell*, 4571 (NY). ORANGE Co.: vacant lot, Orlando, Aug. 16, 1929, *C. J. Williams* (F); high pineland, Gotha, Sept. 2, 1929, *F. Vasku* (F); pineland, Windermere, Aug. 27, 1929, *F. Vasku* (F); sandhill, Windermere, Sept. 10, 1929, *F. Vasku* (F);

high pineland, Windermere, Sept. 1, 1929, *E. West* (F); sandy woods, Windermere, Sept. 30, 1929, *E. West* (F); HILLSBOROUGH Co.: sandhills, Tampa, Sept. 17, 1904, *A. Fredholm*, 6392 ((G plant to left); Tampa, Oct. 1877, *A. P. Garber* (G, P (plant to right)). ALABAMA. COVINGTON Co.: 1-2 mis. e. of Florala, Sept. 13, 1912, *F. W. Pennell*, 4631 (NY). LOUISIANA. Co. UNDETERMINED: s. w. Louisiana, *ex Herb. C. Mohr* (US).

Liatris pauciflora was described by Pursh as a glabrous plant, from a collection by Bartram in Georgia. Elliott, later described *L. secunda* as a reclining species, with short-pubescent stem, growing on the summits of dry sandhills and common near Columbia, South Carolina. This has generally passed into synonymy under *L. pauciflora*. Since, in his flora, Pursh made two divisions of the genus, tuberous and non-tuberous, and placed *L. pauciflora* in the latter group (DeCandolle doing likewise), it was judged by Nash (Bull. Torr. Bot. Club. xxii. 152 (1895)) that the description of this Pursh species was not that of a *Liatris* at all and that *Liatris secunda* Ell. was the legitimate name for *L. pauciflora* of Gray (Synop. Fl. l. c.).

There is in the Banks Herbarium at the British Museum a specimen¹ of *L. pauciflora* Pursh, a photograph of which was obtained by Mr. Weatherby, labelled in pencil in the same handwriting as is the type of *L. gracilis* Pursh, which would therefore seem to be the type of *L. pauciflora* Pursh. Examination of the photograph confirms the glabrous nature of the rachis of the inflorescence and a part of the stem, though much of the stem, the basal leaves and the underground stem are lacking (the last omission perhaps explaining the error Pursh made in classifying the plant). The heads are noticeably borne severally along slender, erect, peduncles 3-5 cm. long, thus making the inflorescence a simple panicle. The heads and phyllaries are as described by Pursh. Specimens paralleling this type have been seen in herbaria mostly from the northern half of peninsular Florida.

¹ Though the type specimen bears no collector's name, date or place of collection, in the recently published diary of John Bartram (Diary of a Journey through the Carolinas, Georgia, and Florida, July 1, 1765 to Apr. 10, 1766, John Bartram, annotated by F. Harper, Trans. Amer. Phil. Soc. n. s. xxxiii. pt. 1, 1-120 (1942)), mention is made of *Serratula* at Turtle Creek in Georgia, which would be Glynn Co., and very near the Florida border. Also in the report of William Bartram (Travels in Georgia and Florida, 1773-74, a report to Dr. John Fothergill, William Bartram, annotated by F. Harper, Trans. Amer. Phil. Soc. n. s. xxxiii. pt. 2, 121-242 (1943) reference to *Serratula* in Georgia is found twice: (1) Brier Creek, in Screven or Burke Co. and (2) the Ridge, referred to as south of the forking of the Tulagoo from the Savannah R., probably in Madison or Oglethorpe county, from the route shown on the map.

Though the type of *L. secunda* Ell. is unfortunately no longer available, there is at the Gray Herbarium a small envelope labelled "*L. secunda* Ell. ex. Herb. Ell.", from which it is possible to see the nature of the puberulent stem and to make flower-measurements. The cylindrical head is 1.5 cm. long and compact as that of *L. punctata* but with thin glabrous phyllaries, an achene only 4 mm. long, and the pappus not conspicuously plumose. The corolla when boiled is 12 mm. long, and has only a few scattered hairs within and without the tube. Specimens having similar characters are often reclining and the heads of the loose raceme often become secund. Herbaria show numerous specimens from the New Hanover and Brunswick coastal region of North Carolina, from South Carolina and Georgia but fewer from Florida and they are mostly from the western counties. The characters of the flower-parts of glabrous specimens growing in sandhills through the northern half of peninsular Florida that match the type of *L. pauciflora* are very similar to those of *L. secunda* but the plants are usually erect, the leaves are narrowly linear and the heads are frequently borne in a loose erect panicle. The only puberulent specimens seen from peninsular Florida came from Windermere, Gotha and Orlando, three very adjacent stations in Orange County, and one plant each of collections by Garber and Fredholm labelled as from Tampa and Hillsborough respectively. These two latter specimens might possibly have been obtained by the collectors elsewhere. Since the more northern specimens are persistently puberulent we are led to retain *L. secunda* Ell. as a separate species, as did Small, though not in synonymy with *L. carinata* Small (see no. 11).

Confusion has resulted from failure to recognize the almost glabrous specimens from North and South Carolina of so-called *L. carinata* as resembling species of the *Graminifoliae* rather than the *Pauciflorae* series and in its given synonymy with *L. secunda*. As pointed out (see no. 11) *L. regimontis*, here including *L. carinata*, has a corolla only 7–8 mm. long and is quite pilose within at the base of the tube whereas the corolla of *L. secunda* is 10–12 mm. long and has only a few scattered hairs within and without. The length of the heads too is greater, 1.5–2 cm. long in *L. secunda* and *L. pauciflora* and only about 1 cm. in *L. regimontis*. When these confusing glabrous specimens of the Caro-

linas are thus classified as *L. regimontis* of the *Graminifoliae*, the *Pauciflorae* specimens of the same region all prove to be puberulent and a match for *L. secunda* Ell., just as the wholly glabrous specimens in Florida give confirmation to the species *L. pauciflora*. No glabrous specimens from Georgia have been seen except the type plant. Though no locality was given by Pursh for Bartram's plant from Georgia it could possibly have been collected very near the Florida border (see last footnote).

That a glabrous species, *L. pauciflora*, should be generally found in a more southerly region than a related puberulent species of the same series, *L. secunda*, is in strong contrast to finding the rare hirsute form in the widespread species *L. spicata*, in some few plants of its variety *resinosa* from Florida and Louisiana. It is however in agreement with the condition obtaining in the series *Tenuifoliae*, where likewise the glabrous *L. laevigata* is limited to peninsular Florida, while the related *L. tenuifolia*, with a tendency to ciliate leaves, extends northward to South Carolina.

SERIES V. TENUIFOLIAE. Herbs showing the tallest and most slender spikes of the genus, attaining a height of 12 dm., with basal rosettes of long filiform to linear coriaceous leaves, diminishing abruptly to short setaceous bracts; heads 4-6-flowered, ca. 1 cm. long, but not compact in appearance when mature due to the few narrow linear thin phyllaries that are not appressed when the flowers are open; corolla-tube non-pilose within but with short hairs on the filaments of the stamens; achenes 3-4 mm. long.

From dry and moist lands from South Carolina to Big Pine Key, Florida.

- a. Plants with scattered hairs along stem; leaves dull, sparsely ciliate, very narrow, filiform; of more northern distribution
15. *L. tenuifolia*.
- a. Plants completely glabrous; leaves glossy, coriaceous, non-ciliate and linear; peninsular Florida only 16. *L. laevigata*.

15. LIATRIS TENUIFOLIA Nutt. Corm small, rounded, up to 2 cm. in diameter: stems slender and spicate, 6-12 dm. high: leaves glabrous and punctate; lower ones long, linear, filiform, 10-25 cm. long, not more than 2 mm. wide, broadening at the point of attachment and often with scattered cilia at their bases, crowded into a rosette from which cauline leaves abruptly diminish to erect setaceous bracts 1 cm. or more long; heads 4-5-flowered, in a long, lax spike, long raceme or narrow panicle, sessile or on

short, very slender pedicels 6–9 mm. long; phyllaries glabrous, the outer acute and only about half as long as the inner oblong-elliptic ones, 6–10 mm. long, with petaloid margin, frequently purple and with midvein often terminating in a short cusp; corolla phlox-purple, rarely white, 6–8 mm. long, smooth within, but filaments of the stamens with short hairs; achene ca. 3 mm. long, pappus 5–7 mm. long, barbellate, and not plumose to the naked eye; flowers said to be fragrant.¹—Nutt. Gen. ii. 131 (1818); Ell. Sk. ii. 275 (1822?). *Laciniaria tenuifolia* O. Ktze. Rev. Gen. Pl. i. 349 (1891).

South Carolina to Florida and Alabama.—STATE UNDETERMINED. *Torrey* (NY), *Chapman*, 7 (NY), *Leavenworth* (NY). SOUTH CAROLINA. Without stated locality: Hb. Gibbes (G, NY). CHESTERFIELD Co.: among scrub-oak and long-leaf pine, 1 mi. w. of McBee, Sept. 7, 1939, *R. K. Godfrey*, 8074 (G, NY). DARLINGTON Co.: Society Hill, *M. A. Curtis* (G). RICHLAND Co.: sandy woods, near Columbia, Sept. 25, 1883, *J. D. Smith*, 2032 (US). AIKEN Co.: Aiken, Sept. 12–15, 1909, *W. W. Eggleston*, 5045 (G, NY, US); dry scrub, Aiken, Sept. 1866, *H. W. Ravenel* (G); Aiken, Sept. 1869, *H. W. R.* (US). GEORGIA. Without stated locality: *Boykin* (G, NY). RICHMOND Co.: pine & blackjack hills, Summerville near Augusta, Sept. 21, 1883, *J. D. Smith*, 2033 (US); dry pine barrens, Augusta, *A. Cuthbert* (F); sandhills, high ridges, Augusta, Sept. 1899, *A. Cuthbert*, 312 (NY); sandhills, Augusta, Sept. 1899, *A. Cuthbert*, 1132 (F); sandhills, 1 mi. n. of Mt. Lebanon Church, Oct. 17, 1937, *J. H. Pyron & R. McVaugh*, 1895 (US). BURKE Co.: without stated locality, Sept. 15, 1897, *M. H. Hopkins*, 38 (NY). SCREVEN Co.: oak ridge, in s. e. part of county, Sept. 29, 1940, *D. Eyles*, 7554 (G). CRISP Co.: sandy soil, Cordele, Sept. 18, 1901, *Biltmore Herb.*, 4116e (US). SUMTER Co.: high sandy banks of Flint R., Sept. 10, 1900, *R. M. Harper*, 634 (G, NY, US). FLORIDA. Without stated locality: *Chapman* (US, 4557 & 31492); *Nuttall* (P, isotype); *Chapman*, ex Herb. *C. Mohr* (US), ex Herb. *Sartwell* (US); *Chapman* (NY); *Dr. Burroughs* (NY); *Curtiss*, 188 (NY). DUVAL Co.: dry pine barrens, Jacksonville, Oct. 24, 1894, *A. H. Curtiss*, 5310 (G, US); near Jacksonville, Oct. 13, 1893, *A. H. Curtiss*, 4447 (US); s. of Jacksonville, Aug. 1896, *L. H. Lighthipe*, 339 (NY). COLUMBIA Co.: north of Camp Oleno, Oct. 6, 1940, *W. A. Merrill* (F). HAMILTON Co.: dry woods on Suwannee R., White Springs, Sept. 30, 1941, *E. West & Miss L. Arnold* (F). LEON Co.: Tallahassee, *N. K. Berg* (NY); Tallahassee, Oct. 7, 1895, *Biltmore Herb.*, 576 (US). GADSDEN Co.: dry soil, River Junction, Sept. 22, 1900, *Biltmore Herb.*, 4116d (US); high pine-oak-woods near Havana, Oct. 6, 1940, *W. A. Merrill* (F). JACKSON Co.: without locality, Aug. 23, 1880, *E. A. Smith* (US).

¹ See introduction.

FRANKLIN Co.: dry pine barrens, Apalachicola, 1867, *B. F. Saurman* (Q). BAY Co.: sandy moist open ground, Lynn Haven, Oct. 12, 1921, *C. Billington* (US). WALTON Co.: dry sandy soil, Argyle, Aug. 25, 1899, *Biltmore Herb.*, 4116b (US). SANTA ROSA Co.: dry sandy pineland, Sept. 9, 1912, *F. W. Pennell*, 4575 (NY). ALACHUA Co.: dry fields, Gainesville, Oct. 7, 1928, *G. F. Weber* (F); flatwoods, Gainesville, Oct. 14, 1927, *Miss L. Arnold* (F); open fields, Archer Road, Gainesville, Oct. 12, 1931, *Miss L. Arnold* (F). GILCHRIST Co.: dry woods, 6 mis. e. of Trenton, Oct. 5, 1940, *E. West & Miss L. Arnold* (F). TAYLOR Co.: 9 mis. s. of Perry, Oct. 8, 1940, *W. A. Murrill* (F). MARION Co.: 4 mis. s. of Belleview, Oct. 13, 1940, *W. A. Murrill* (F). LEVY Co.: flatwoods, 5 mis. e. of Otter Creek, Nov. 11, 1939, *Watson & W. A. Murrill* (F). VOLUSIA Co.: (typical and albino) dry soil, pine woods, s. of New Smyrna, Oct. 14, 1944, *Mrs. H. T. Butts* (OA). ORANGE Co.: Lake Mary, Nov. 17, 1902, *S. M. Tracy* (US); pinelands, Gotha, Aug. 22, 1929, *E. West* (F); flatwoods, Orlando, Oct. 9, 1929, *F. Vasku* (F); (albino) flatwoods, Orlando, Oct. 22, 1929, *De Vane & West* (F). LAKE Co.: 5 mis. s. w. of Astor Park, Oct. 13, 1940, *W. A. Murrill* (F). CITRUS Co.: sandy dry oak-pine-woods, on U. S. 41, 1 mi. n. of Inverness, Oct. 16, 1945, *H. H. Hume* (F). POLK Co.: Haines City, Nov. 1917, *R. H. Young* (US); Fort Meade, April 4, 1880, *J. D. Smith* (US); sandy place, July 27, 1940, *P. O. Schallert* (G). HILLSBOROUGH Co.: Tampa, Oct. 1877, *A. P. Garber* (G, US); dry sand, Oct. 13, 1904, *A. Fredholm*, 6422 (G). MANATEE Co.: Bradentown, Aug. 10, 1900, *S. M. Tracy*, 7100 (NY, T); flatwoods, Bradentown, Oct. 30, 1916, Oct. 27, 1920, *A. Cuthbert* (F). DADE Co.: in tropical pineland, Miami, Nov. 28, 1933, *F. Duckett*, 242 (US); Buena Vista, Jan. 21, 1930, *H. N. Moldenke*, 483a (NY); w. of Rockdale, Nov. 18, 1916, *J. K. Small*, 7907 (NY). ALABAMA. Without stated locality: *ex. Herb. G. Thurber* (G). CHEROKEE Co.: dry soil, dry ridges, near Bristol, Oct. 25, 1895, *C. Mohr* (US). COVINGTON Co.: Blue Springs, near McRae, Sept. 13, 1912, *F. W. Pennell*, 4616 (NY).

See discussion following the next species, *L. laevigata* Nutt.

16. LIATRIS LAEVIGATA Nutt. Corm stout, globular or somewhat broadened, larger than that of *L. tenuifolia*, up to 4 cm. in diameter; stems shorter, frequently not attaining the extreme height of that species: lower leaves entirely glabrous, punctate, involute, long, linear, but not filiform, 2-3 dm. long, 2-8 mm. wide, broadening and sheath-like at the point of attachment, shining, coriaceous, in a rosette at the base, diminishing abruptly to short erect setaceous glabrous bracts: spike sometimes becoming paniced, 3-6 dm. long; heads 4-6-flowered, usually sessile or on slender pedicels 6-9 mm. long; outer phyllaries short,

narrowly acute: the inner oblong, elliptic, 6–10 mm. long, often with obtuse petaloid tips and frequently purple; corolla phlox-purple, 7–8 mm. long, smooth internally but filaments of stamens with short hairs; achenes ca. 3 mm. long; pappus 5–7 mm. long, barbellate, and not plumose to the naked eye.—Nutt. Trans. Amer. Phil. Soc. n. s. vii. 285 (1841). *Liatris tenuifolia* β Torr. & Gray, Fl. N. Am. ii. 70 (1841). *Liatris tenuifolia* var. *laevigata* (Nutt.) Robinson, Proc. Amer. Acad. Arts and Sci. xlvii. 201 (1911). *Liatris tenuifolia* var. *quadriflora* Chapm. Fl. S. U. S. ed. 2, Suppl. 626 (1883). *Laciniaria laevigata* (Nutt.), Small, Fl. S. E. U. S. 1175 (1903).

Found only in peninsular Florida, along the coast as far south as Big Pine Key.—FLORIDA. Without stated locality: Nov. 26, *J. Read* (P, isotype). DUVAL Co.: vicinity of Mayport and Jacksonville, 1870–76, *H. D. Keeler* (NY, ND); St. Nicholas, Oct. 1897, *L. H. Lighthipe* (NY), dry pine barrens, near Jacksonville, Oct., *A. H. Curtiss*, 1174 (US, 63074); near Jacksonville, 1893, *A. H. Curtiss*, 4447 (NY); dry pine barrens, near Jacksonville, Oct. 7, 1898, *A. H. Curtiss*, 6289 (F). BAKER Co.: Glen Saint Mary, Oct. 1927, *H. Hume* (G). FRANKLIN Co.: Apalachicola, *Biltmore Herb.*, 4116a (NY, Q). SAINT JOHNS Co.: flatwoods, Road 14A, near Spuds, Oct. 14, 1941, *E. West & Miss L. Arnold* (F). CLAY Co.: cut-over pine woods, Keystone Heights, Oct. 11, 1945, *H. Hume, Nevins & Miss L. Arnold* (F). PUTNAM Co.: scrubby flatwoods, n. of Beecher Springs, Welaka, Sept. 28, 1940, *A. M. Laessle* (F). ALACHUA Co.: south of Prairie, Alachua, Oct. 24, 1940, *W. A. Murrill* (F). FLAGLER Co.: flatwoods, 5 mis. e. of Co. line, Hwy. 28, Andalusia, Oct. 10, 1940, *E. West & Miss L. Arnold* (F). MARION Co.: in a scrub, Ocala National Forest, Sept. 12, 1929, *H. O'Neill* (US, F). VOLUSIA Co.: pine wood, dry sandy soil, s. of New Smyrna, Oct. 14, 1944, *Mrs. H. T. Butts* (OA). SEMINOLE Co.: high pinelands, Sanford, Sept. 22, 1927, *O. F. Burger & E. West* (F). LAKE Co.: Eustis, Aug. 16–25, 1894, *G. V. Nash*, 1669 (G, NY, P, ND, US); Eustis, Sept. 10, 1895, *G. V. Nash*, 2599 (G, NY, ND, US); sandy soil, Eustis, Sept. 10, 1900, *Biltmore Herb.* 4116e (US); open sand, 5 mis. e. of Leesburg, Aug. 17, 1939, *W. A. Murrill* (F). ORANGE Co.: Clarcona, Sept. 25, 1899, *Miss M. Meislahn*, 72a (US); high pineland, Wekiwa Springs, Sept. 25, 1929, *H. O'Neill* (US); flatwoods, Gotha, Aug. 30, 1929, *F. Vasku* (F); pineland, Windermere, Sept. 3, 1929, *F. Vasku* (F); sandhills, Windermere, Sept. 10, 1929, *F. Vasku* (F). BREVARD Co.: pine barrens, Indian River Region, Nov. 9, 1902, *A. Fredholm*, 5565 (G); sandy soil, Cocoa, Sept. 5, 1936, *A. S. Rhoads* (F). OSCEOLA Co.: low pinelands, Deer Park, Sept. 24, 1927, *O. F. Burger & E. West* (F). HILLSBOROUGH Co.: flatwoods, w. of Plant City, Aug. 19, 1945, *L. O. Gaiser, Mrs. H. T. Butts & Miss L. Arnold*

(F). OKEECHOBEE Co.: Okeechobee, Sept. 26, 1903, A. Fredholm, 6022 (G); pine woods, Okeechobee, Oct. 12, 1941, J. H. Davis (F). MANATEE Co.: Bradentown, Aug. 10, 1900, S. M. Tracy, 7100 (G, US). MARTIN Co.: pine flatwoods, w. of Stuart, Nov. 23, 1942, J. H. Davis (F). SARASOTA Co.: airfields in flatwoods, Venice, Aug. 18, 1945, L. O. Gaiser, Mrs. H. T. Butts & Miss L. Arnold (F). CHARLOTTE Co.: flatwoods ditch, s. of Punta Gorda, Aug. 18, 1945, L. O. Gaiser, Mrs. H. T. Butts & Miss L. Arnold (F). LEE Co.: Marco, A. S. Hitchcock, 154 (G, NY, US). COLLIER Co.: golf course, Naples, Nov. 2, 1939, Miss E. Scull (F). DADE Co.: pinelands, s. of Miami R., Nov. 26, Dec. 20, 1913, J. K. Small & G. K. Small, 4791 (NY); between Miami & Kendall Sta., Nov. 5, 1906, J. K. Small & J. J. Carter, 2752 (NY); pinelands, s. of Miami R., Nov. 20, 1912, J. K. Small, 3858 & 3848 (NY); pinelands, Miami, Oct. 28–Nov. 28, 1903, J. K. Small & J. J. Carter, 534 (NY, P); between Cocoanut Grove & Cutler, Oct. 31, Nov. 4, 1903, J. K. Small & J. J. Carter, 1457 (NY); Cocoanut Grove, Nov. 2–5, 1901, J. K. Small & G. V. Nash, 184 (NY); pinelands, Cutler, Mar. 27, 1904, N. L. Britton, 287 (NY); Homestead, Sept. 16, 1927, S. Hawkins (F); pinelands, Big Pine Key, Dec. 2, 1912, J. K. Small, 3966 (NY); Pine Key, J. L. Blodgett (NY); Long Pine Key, Aug. 25, 1937, Miss E. Scull (F).

Nuttall (Gen. ii. 131 (1818)) described *L. tenuifolia* as having "leaves almost like those of *Pinus palustris* but flat and linear", and as being 2–4 feet tall with a long raceme of 1–2 feet (a photograph of his type at the British Museum, received through Mr. Weatherby, shows a stem about 6 feet tall). He gave the habitat as sandy forests of North and South Carolina. By comparison of specimens in the herbaria with this photograph of the type, this species does not seem to have been collected in North Carolina, but from South Carolina to Florida and westward through Alabama. Chapman (Fl. S. U. S. ed. 2, Suppl. 626 (1883)) described *L. tenuifolia* var. *quadriflora* from the banks of the Caloosa River, S. Florida, as having rigid, involute leaves and those of the upper stem setaceous.

In 1841, Nuttall (Trans. Amer. Phil. Soc. vii. 285 (1841)) described as a new species *Liatris laevigata*: "with almost filiform, subulate leaves; radical ones nearly a foot long, pungently acute and coriaceous". Examination of a photograph of the type specimen in the British Museum shows a plant only a little more than one foot high and with few basal broader leaves, that seems to include the concept of Chapman's var. *quadiflora*, and that is represented in the herbaria by specimens from along the Florida

coast to Big Pine Key. Although Nuttall referred to *L. tenuifolia* as being "everywhere smooth" and *L. laevigata* as "in every part very smooth", close study of the photograph of the former type shows some scattered cilia at the base of the leaves. Such a presence of cilia, in varying degrees, seems to be a constant accompaniment to the finely linear leaves of specimens from South Carolina, Georgia and Alabama. Plants wholly glabrous, having glossy, involute, almost quill-like leaves varying in width from 2 to 8 mm., are found only in peninsular Florida. It seems possible too that these latter may be more moisture-loving as they occur often in low pinelands and in flatwoods where the water level may be high.

Torrey & Gray (Fl. N. Am. ii. 70 (1841)) treated *L. laevigata* as a variety of *L. tenuifolia* and this was followed in Gray, Synop. Fl. i². 112 (1884), and in Proc. Amer. Acad. Sci. xlvii. 201 (1911), where Robinson described it as a conspicuously more robust variety and referred to specimens of Mr. G. V. Nash, no. 1669 and no. 2599, both from Eustis, Florida, as examples, and to that of Prof. Hitchcock, no. 154, also from Marco, Florida, as representing an intergradation between the more slender and more robust forms. The diameters of the corms of these three specimens, represented in three herbaria visited (G, NY, US), vary slightly, but all range between 18 and 38 mm. in diameter, thus coming well within the general measurements for *L. laevigata*. In collections from Florida there is evidence that the two types occur side by side as selections from the lists of specimens will show:

MANATEE Co.: Bradentown, S. M. Tracy, 7100, ((G, US, resembles *laevigata*), (NY, T, resembles *tenuifolia*)); FRANKLIN Co.: Apalachicola, Biltmore Herb. 4116a ((G, US, resembles *tenuifolia*), (NY, Q, resembles *laevigata*)); DUVAL Co.: Jacksonville, A. H. Curtiss, 1174 ((US 3074, resembles *laevigata*), (US 63073 & G, seem intermediate)).

Other specimens from Florida give evidence of intergradation between the two, as Robinson stated, in having leaves of intermediate width, or having some cilia at the base of the leaves, as well as showing intermediacy of stoutness of above- and below-ground stems. Some of these are listed below:

Without stated locality: Chapman (ex Herb. G. Thurber (G) & 449, 450 (US) & US 63076, US 968368); 1842-1844, F. Rugel (US). MANATEE Co.: Manatee, J. H. Simpson (US). DUVAL

Co.: Jacksonville, Nov. 1891, *W. G. Farlow* (G); Jacksonville, Oct., *A. H. Curtiss*, 1174 (G). DADE Co.: Miami, Nov. 28, 1933, *F. Duckett*, 242 (G). GULF Co.: St. Vincent Isl., Nov. 2, 1910, *W. L. McAtee*, 1810 (US). VOLUSIA Co.: s. of New Smyrna, Oct. 14, 1944, *Mrs. H. T. Butts* (OA).

However, the great interest lies in the fact that all the intermediates come from Florida where both species have their greatest (and *L. laevigata* its exclusive) distribution. *Mrs. H. T. Butts* has collected from one location, south of New Smyrna, both *L. laevigata* and *tenuifolia* (including an albino specimen), as well as what has been here interpreted as an intermediate. Yet in the dry scrub of South Carolina or the sandy hills of Georgia the more slender *L. tenuifolia* alone seems to be represented. Thus because of the limitations in habitat of *L. laevigata* as well as the quite different appearance of leaf and plant, they are regarded as separate species that intergrade in Florida where their ranges overlap.

× LIATRIS BOYKINII Torr. & Gray, emend. (*L. elegans* × *tenuifolia*). Stem nearly glabrous, slender, 3–6 dm. tall: leaves rather scattered, linear, lower elongated, upper short and setaceous: spike 1.5–2.5 dm. long, of rather crowded, subsessile or shortly pedicellate, 3–4-flowered heads; phyllaries glabrous, the outer ones short, lanceolate-subulate, the interior lanceolate or linear, with scarious margins and acuminate spreading summits, surpassing the flowers in length; flowers pale purple; corolla 9 mm. long, tube as well as filaments without any hairs; pappus 7 mm. long, plumose; achene ca. 4 mm. long, villous.—Fl. N. Amer. ii. 70 (1841).

GEORGIA. MUSCOGEE Co.: near Columbus, *Dr. Boykin* (G, NY, TYPE). SUMTER Co.: along the high, sandy bank of Flint River, Sept. 10, 1900, *R. M. Harper*, 635 (NY, US).

L. Boykinii was described by Torrey & Gray from a plant collected near Coumbus, Georgia, by *Dr. Boykin* (G, NY). Later Gray (*Synop. Fl. i*¹. 110 (1884)) again included it, referring only to the single collection and stating: "not since found". Heads of this species were said to be larger than in *L. tenuifolia* and rather smaller than those of *L. secunda*. *Small, Man. S. E. Fl.* 1333 (1933), states: "perhaps a hybrid between *L. elegans* and *L. tenuifolia*". In 1900, *R. M. Harper* collected specimens, no. 635, along the high sandy bank of the Flint River, Sumter Co., Georgia (NY, US), with *L. elegans* and *L. tenuifolia*, noting on one sheet that the plants were intermediates between the two

species. Examination of these specimens shows the upper leaves very narrow and linear, quite like those of *L. tenuifolia*. The heads, 4-flowered, ca. 10 mm. long, have outer phyllaries that are narrowly lanceolate and inner ones with free spreading, pink, petaloid, prolonged tips suggesting the bracts of *L. elegans*. In numbers of flowers per head, in characters of corolla-tube, pappus and achene, the Harper collection bears a resemblance to Dr. Boykin's plant and it seems probable that these two collections from Georgia, where both *L. tenuifolia* and *L. elegans* occur, represent intermediates between the two species. During this investigation no other specimens have been found.

SERIES VI. SCARIOSAE. Plants with stiff, robust stalks of the inflorescence bearing few to numerous large, campanulate, hemispheric or subglobose heads in loose open spikes or panicles; leaves mostly lanceolate, rarely oblanceolate; heads 15–70-flowered; phyllaries broad, orbicular, spatulate or obovate, mostly squarrose or bullate before the opening of the flowers; corolla-tube pilose within (except in *L. ligulistylis*); achene 3–7 mm. long.—From along the coast in New England, southward to Georgia, westward through Tennessee and Kentucky, to become widespread from Michigan and Wisconsin southward to Texas and Oklahoma and westward from the prairie provinces along the Rocky Mts. to New Mexico.

- a. Heads short-cylindrical to globose. . . . b.
- b. Heads subglobose, 25–50-flowered; phyllaries squarrose or bullate from before the time of opening of flowers (except in *L. scariosa* var. *virginiana*) c.
- c. Phyllaries herbaceous, ciliolate, with only very narrow (if any) scarious margin, pubescent to rough; outer ones markedly and middle ones moderately squarrose; leaves and stem pubescent, basal leaves broadly obovate. 17. *L. scariosa*.
- c. Phyllaries thin, glabrous, broadly scarious, erose and colored, all markedly bullate; stem and leaves asperous or glabrous; leaves linear to linear-lanceolate. 18. *L. aspera*.
- b. Heads short-cylindrical to subglobose, 25–40-flowered; phyllaries mostly erect, appressed and herbaceous, never bullate and erose, though outer ones sometimes recurved. 19. *L. scabra*.
- a. Heads campanulate to hemispheric; phyllaries erect and loosely appressed through the maturing of the flowers. . . . d.
- d. Heads hemispheric, 25–70-flowered. . . . e.
- e. Leaves few, glabrous to densely pubescent but scabrous to the touch along the margin; basal leaves broadly lanceolate, reduced abruptly upwards to linear bracts; phyllaries broadly spatulate with deep scarious, erose and colored margins; inflorescence of few to 20 heads; corolla-tube non-pilose within. 20. *L. ligulistylis*.

- e. Leaves numerous, glabrous or with but scattered pubescence on the lower surface and along the margin, often twisted, all linear-lanceolate; phyllaries oblong, herbaceous, hardly at all scarious but finely ciliolate on the margin; inflorescence of usually more than 20 heads. 21. *L. borealis*.
- d. Heads campanulate, 15–25-flowered; leaves lanceolate, with upper ones sometimes linear, glabrous to asperous; phyllaries oblong to narrowly spatulate, mostly herbaceous and light green, with very narrow (if any) membranous margins, outer ones sometimes squarrose. . . . 22. *L. Earlei*.

17. *LIATRIS SCARIOSA* (L.) Willd. Corm rounded, up to 5 cm. in diameter: stems one to several, usually with dense semi-appressed pubescence, 4–8 dm. high: leaves not numerous, from sparingly to densely pubescent, even to scabrous to the touch on both sides; basal leaves 0.8–1.5 dm. long, and 2–5 cm. wide, broadly oblanceolate, oblong to almost obovoid, narrowing to clasp the stem; upwards the bluntly oblanceolate leaves shortening through narrower ones 4–7 cm. long and 0.5–0.7 cm. wide, to bracts subtending the heads: inflorescence of 15–30 almost globular heads in an open raceme or occasionally panicle: heads 15–50-flowered, subglobose, 1.5–2.5 cm. in diameter, on short pedicels or occasionally longer ones forming a panicle-like inflorescence; phyllaries rather leathery and mostly recurved (except in var. *virginiana*), the outermost ones ovate and soon recurved, the middle and inner ones rounded at the tips, also somewhat recurved, mostly herbaceous, sometimes showing color, with a very narrow, thinner, ciliolate margin; corolla purple, pilose in the base of the tube, 7–11 mm. long; pappus 6–9 mm. long; achene 4–5 mm. long.—Spec. Pl. iii. 1635 (1803). *Serratula scariosa* Linn. Sp. Pl. ii. 818 (1753).

Mostly in the mountains from southern Pennsylvania to the border of South Carolina but one variety from the plains in the Carolinas, Georgia and Alabama.

KEY TO VARIETIES

- a. Phyllaries herbaceous, the outer ones soon recurved, the middle and inner ones somewhat recurved; basal leaves broadly obovate, the upper ones oblanceolate. . . . b.
- b. Heads of 25–50 flowers. var. *typica*.
- b. Heads of 15–25 flowers. var. *squarrulosa*.
- a. Phyllaries mostly herbaceous or with narrow membranous margin, the outer ones but slightly if at all squarrose, middle and inner ones loosely erect; basal leaves broad- to long-lanceolate. var. *virginiana*.

Var. *typica*. Stem, leaves and phyllaries as described for the species: heads large, 25–50-flowered: corolla-tube 10–11 mm. long; pappus 8–9 mm. long; achene ca. 5 mm. long.—*Serratula scariosa* L. Sp. Pl. 818 (1753), sens. strict., with plant of Linnaean herbarium as type, not that of Gronovius.

In the Appalachian mountains from southern Pennsylvania through North Carolina.—PENNSYLVANIA. Co. undetermined: Mts. Alleghany, *Rafinesque* (P). PERRY Co.: Upper Henry Valley, Sept. 5, 1920, *W. L. Abbott* (P). FRANKLIN Co.: Mercersburg, *ex. Detwiler Herb.*, 17-1 (P); Blue Ridge Summit, 1886, *E. Tatnall* (G). FULTON Co.: McConnellsburg, Sept. 1907, *C. S. Williamson* (P), Sept. 1907, *E. B. Bartram*, collected by *W. S.* (NY); Tonoloway Creek, Sept. 20, 1870, *E. L. Tenbrook* (P). MARYLAND. BALTIMORE Co.: without stated locality, Aug. 1886, *G. L. S.*, 1176 (G). ALLEGHANY Co.: Cumberland, Sept. 12, 1910, *J. E. Harned* (US, 648416, -17); mountainside, near Cumberland, Sept. 1934, *W. Rhoades* (G); s. of Cumberland, Sept. 8, 1926, *E. S. Steele*, 97 (G). VIRGINIA. FREDERICK Co.: shale near Dehaven, Sept. 15, 1940, *F. W. Hunnewell*, 16947 (G). LOUDON Co.: opposite Point of Rocks, Sept. 12, 1935, *W. R. Maxon*, 10770 (US). WARREN Co.: dry woods, near Bentonville, Sept. 7, 1938, *F. W. Hunnewell*, 15762 (G). PAGE Co.: vicinity of Blue Ridge, Stony Man Mt. near Luray, Sept. 2, 1901, *E. S. & Mrs. Steele*, 224 (US, 418571). FAIRFAX Co.: Difficult Run, Sept. 29, 1904, *W. Palmer* (US), Sept. 18, 1899, *E. S. Steele* (US); pike near Difficult Run, Sept. 30, 1911, *E. S. Steele* (G); pike near Difficult Run, Oct. 6, 1907, *E. S. Steele* (G, US); near mouth of Difficult Run, Sept. 25, 1909, *F. W. Pennell* (US); pike near Difficult Run, Great Falls, Oct. 2, 1910, *F. W. Pennell* (US). SHENANDOAH Co.: Massanutten Mts., s. end of Short Mt., steep dry shales near roadside, Aug. 19, 1938, *H. A. Allard*, 5466 (G); low hills, s. of hotel, vicinity of Orkney Springs, alt. 450 m., Sept. 11, 1911, *E. S. Steele*, 121 (US, 1521106); low hills s. of hotel, vicinity of Orkney Springs, alt. 480 m., Sept. 11, 1911, *E. S. Steele*, 126 (G); 127 (US); on true shale barrens, at foot of Pugh's Run, n. of Woodstock, Massanutten Mt., Sept. 22, 1940, *H. A. Allard*, 8228 (G). HIGHLAND Co.: shale barrens, Shenandoah Mt., Staunton-Monterey Road, Sept. 9, 1934, *Miss E. S. Rawlinson* 269 (US). BLAND Co.: East River Mt., in rocky places, Sept. 1, 1931, *E. L. Core*, 6841 (NY). RAPPAHANNOCK Co.: 6 mis. w. of Sperryville, Sept. 21, 1905, *Mrs. E. P. Miller* (US590496, -7). WEST VIRGINIA. MORGAN Co.: Largent, Aug. 25, 1933, *E. J. Alexander*, *T. H. Everett*, *S. D. Pearson* (NY). HAMPSHIRE Co.: dry sandy woods, Cold Spring Gap, North Mt., Sept. 6, 1936, *F. W. Hunnewell*, 14430 (G). HARDY Co.: Bean Settlements, Sept. 27, 1930, *W. M. Sharp* (G). GREENBRIER Co.: White Sulphur Springs, Sept. 7, 1906, *E. S. Steele* (US 494223). NORTH CAROLINA. DURHAM Co.: open rocky ground, near Eno R., *H. L. Blomquist*, 10518 (P); edge of ditch, Duke Forest, Oct. 1, 1932, *H. L. Blomquist*, 439 (US).

Var. **SQUARRULOSA** (Michx.) Gray. Differing from var. *typica* in slenderer habit, with leaves and heads smaller: heads 15–25-flowered, ca. 1 cm. high and 1–1.5 cm. thick when the flowers are open; corolla-tube ca. 7 mm. long; pappus 5–6 mm. long; mature achene 4 mm. long.—Synopt. Fl. i². 110 (1884). *L. squarrulosa* Michx. Fl. Bor.-Am. ii. 92 (1803); Shinnars, Am. Midl. Nat. xxix. 33 (1943). *Laciniaria scariosa* var. *squarrulosa* Small & Vail. Mem. Torr. Bot. Club, iv. 28 (1894), in part.

Piedmont and Coastal plain of N. and S. Carolina, Georgia and Alabama.—NORTH CAROLINA. DURHAM Co.: Pont Rock, Aug., 1896, *C. S. Williamson* (P); open, rocky ground, north of Eno R., old Oxford Road, from Durham, Sept. 24, 1928, *H. L. Blomquist*, 10578 (F, P). SOUTH CAROLINA. BERKELEY Co.: dry, rich soil, Santee Canal, *H. W. Ravenel*, 3 collections with slightly differing data (G). AIKEN Co.: Aiken, *Ravenel* (NY). GEORGIA. WILKES Co.: without locality, 1833, *Herb. J. A. Lowell* (G). McDUFFIE Co.: pine-barrens, vicinity of Thomson, Oct. 10, 1910, *H. H. Bartlett* 2420 (G, US). RICHMOND Co.: dry barrens, Aug. 1876, and oak woods near pool, Oct. 10, 1898, Augusta, *A. Cuthbert* (F). JEFFERSON Co.: without locality, Sept. 25, 1897, *H. Hopkins* 40, 41 (NY). ALABAMA. MARSHALL Co.: rocky woodland, Albertsville, Oct. 9, 1900, *Biltmore Herb.* 2670a (US).

Var. **virginiana** (Lunell) comb. nov.—Similar in size, habit and floret-characters to var. *typica* but differing in the somewhat reduced more lanceolate leaves and the mostly erect membranous-margined phyllaries: basal leaves broadly lanceolate, 7–12 cm. long, 2–3 cm. wide, narrowed to a winged petiole of about one third the length of the blade, upper ones gradually shortened and non-petiolate; heads 20–30-flowered (sometimes up to 50), ca. 1.5 cm. tall and wide, turbinate to hemispherical by reason of the erect phyllaries; outer phyllaries short, ovate, herbaceous with fine ciliolate margin, sometimes slightly recurved: middle ones longer, loosely erect, herbaceous and ciliolate-margined for the most part but with rounded tips, narrowly erose and usually purplish.—*Laciniaria scariosa* var. *virginiana* Lunell, Amer. Mid. Nat. ii. 172 (1912). *Laciniaria scariosa* var. *borealis* Lunell, ibid 264, probably *Cirsium non ramosum* . . . flores ferens pauciores majores . . . of Gron. Virg. i. 92 (1739).

Mostly in the mountains from southern Pennsylvania to South Carolina.—PENNSYLVANIA. CENTRE Co.: without stated locality, Sept. 5, 1868, *J. T. Rothrock* (G). LEHIGH Co.: on roadside embankment at edge of woods, 1 mi. s. w. of Schnecks-ville, Sept. 30, 1917, *J. W. Pretz*, 9171 (US). HUNTINGTON Co.: dry wooded shaley hillside, 2 mis. n. w. of Petersburg, Sept. 21, 1941, *H. A. Wahl*, 1163 (G). CHESTER Co.: without stated locality, Aug. 1858–64, *S. P. Sharples* (G). BEDFORD Co.:

wood road, 1½ mis. n. w. of Breezewood, alt. 1060', Aug. 3, 1940, *D. Berkheimer*, 2178 (G). MARYLAND. ALLEGHANY Co.: Cumberland, Sept. 12, 1910, *J. E. Harned* (US 648418). GARRETT Co.: Mountain Lake Park, Sept. 2, 1906, *J. J. Carter* (NY), Aug. 30, 1906, *C. D. Lippincott* (NY), Aug. 26, 1928, *E. S. Steele*, 3 (US 14860-45, -49); vicinity of Oakland, Mountain Lake Park, *E. S. Steele*, Sept. 4, 1910 (No. 84 US 64857-1, -2), Sept. 7, 1910 (No. 60 US 648566), Sept. 7, 1910 (No. 21 US 6485-61 to -70 excluding -66), Sept. 16, 1910 (No. 61 US 64857-3, -4); scrubby ground toward Deer Park, Aug. 25, 1921, *E. S. Steele*, 150 (G); low open ground, Rwy. e. of Mountain Lake Park, Aug. 9, 1921, *E. S. Steele*, 118 (G). WEST VIRGINIA. PRESTON Co.: grassy ground n. of Lake, Terra Alta, Sept. 4, 1920, *E. S. Steele*, 299 (US 1117671); flat ground n. of lake, Terra Alta, Aug. 31, 1923, *E. S. Steele*, 166 (US 128604-1, -2); n. side of lake e. of camp, vicinity of Terra Alta, Aug. 18, 1924, *E. S. Steele* (US 1326616); near camp n. of lake, vicinity of Terra Alta, Sept. 11, 1924, *E. S. Steele*, 114 (US 13263-39, -40); roadside toward quarry, Terra Alta, Sept. 9, 1925, *E. S. Steele*, 78 (G, US 148603-6, -7, -8, -9, -40, -43, -44); Boys' Camp n. of lake, vicinity of Terra Alta, Aug. 26, 1926, *E. S. Steele*, 68 (G). TUCKER Co.: Canaan Valley, *W. V. U. Biol. Exped.* (G). GREENBRIER Co.: White Sulphur Springs, Aug. 27, 1903, *K. K. Mackenzie* 363 ((I. type), NY, US, (G, without no.)); mt. north of Springs (alt. 2000'–3000'), White Sulphur Springs, Sept. 7, 1906, *E. S. Steele* (G, US); Kate's Mt., White Sulphur Springs, Sept. 4, 1920, *Miss M. S. Franklin* (G). MONROE Co.: Peter's Mt., Aug. 31, 1903, *E. S. Steele & Mrs. Steele* (US, 490324); vicinity of Old Sweet Springs, *E. S. Steele*, Sept. 11, 1903 (US 648302), Sept. 9, 1905 (US, 590189), Sept. 2, 1905 (US, 590187); ridge of Peter's Mt., on State line, Sept. 12, 1905, *E. S. Steele* (G, US, 590190); Peter's Mt., vicinity of Old Sweet Springs on Va. & W. Va. line, Sept. 11, 1903, *E. S. Steele* (G, US 63531). VIRGINIA: WARREN Co.: Little Passage Creek, Sept. 21, 1897, *G. S. Miller* (US). PAGE Co.: Stony Man Mt., Aug. 11, 1901, *W. Palmer*, 61 (US); crevices of rocks, Stony Man Mt., Aug. 18, 1901, *W. Palmer & W. H. King*, 61 (US); exposed cliffs, Stony Man Mt., near Luray, Aug. 31, 1901, *E. S. Steele & Mrs. Steele*, 224 (G, NY, US); vicinity of Blue Ridge, Stony Man Mt., near Luray, Sept. 2, 1901, *E. S. Steele & Mrs. Steele* 224 (G, NY); near Luray, Sept. 18, 1905, *G. S. Miller* (US). SHENANDOAH Co.: brushy slope, Great North Mt., vicinity of Orkney Springs, Sept. 4, 1911, *E. S. Steele*, 64 (G), 62 (G, US); Great North Mountain, vicinity of Orkney Springs, Sept. 14, 1911, *E. S. Steele*, 141 (G (US, 1520733)); low hills s. of hotel, vicinity of Orkney Springs, Sept. 5, 1911, *E. S. Steele*, 74 (G); vicinity of Orkney Springs, Sept. 4, 1911, *E. S. Steele*, 69 (US 609901-2); on red sandstone barrens, on top of Great North Mt., Sept. 19, 1937,

H. A. Allard, 3765 (G). BATH Co.: sandstone soil, Mill Mt., vicinity of Millboro, Aug. 20, 1906, *E. S. Steele* (G); vicinity of Millboro (alt. 485 m.), *E. S. Steele*, Sept. 3, 1906 (G, US 648421), Sept. 11, 1906 (G, US 494573); on shale in vicinity of Millboro, Sept. 3, 1906, *E. S. Steele* (US, 494572, 648301). ROCKBRIDGE Co.: Mill Mt., vicinity of Millboro, Sept. 16, 1907, *E. S. Steele* (US, 494571). CRAIG Co.: s. of Peter's Mt., vicinity of Orkney Springs, Sept. 12, 1905, *E. S. Steele* (US, 590188); Peter's Mt., Sept. 1, 1903, *E. S. Steele & Mrs. Steele* (G, NY). NORTH CAROLINA. YANCEY Co.: Wayah Bald Summit, Sept. 11, 1933, *E. J. Alexander, T. H. Everett & S. D. Pearson* (NY). BUNCOMBE Co.: vicinity of Montreat, Sept. 9, 1913, *P. C. Standley & H. C. Bolm* (US, 10499, 10501-02, -11, -12, -13, -14). HAYWOOD Co.: on slopes of Pine Mt., vicinity of Eagle's Nest, Sept. 6, 1910, *P. C. Standley*, 5552 (G, US); near Waynesville, near Highlands, *Biltmore Herb.*, 2670v (US, 957890). SWAIN Co.: Great Smoky Mts., Aug. 28, 1891, *E. C. Beardslee & C. A. Kofoid* (G). MACON Co.: below Satula Mt., (alt. 2500') Highlands, Sept. 2, 1902, *E. E. Magee* (G). SOUTH CAROLINA. OCONEE Co.: summit of Thomas Bald Mt., near Georgia border (alt. 5200'), Aug. 19, 1893, *J. K. Small* (NY); eastern base of Tomassee Knob (alt. 1200'), Sept. 14, 1938, *R. T. Clausen & H. Trapido*, 3620 (NY).

No species of *Liatris* has been so misunderstood and become the "catch-all" for as many different entities as *Liatris scariosa*. When describing *Serratula scariosa*, Linnaeus cited Gronovius (Gron. Virg. 92 (1739)), who described a plant observed and collected in Virginia by Clayton as follows: "Cirsium non ramosum foliis lateralibus flores ferens pauciores majores squamis hiantibus armatos pediculis curtis insidentibus, radice etiam tuberosa". The further references to descriptions by Banister (Plant. Virg. Ban. 1929 (1693)) and Plukenet (Pluk. Mant. 105 (1749)) do not clearly identify the species, nor does the figure of Plukenet (Pluk. Phyto. t. 177 f. 4 (1696)) accompanying a description (Pluk. Alm. 142 (1696)) that includes the phrase "floribus scariosis".

Linnaeus added to the description "calycibus squarrosis pedunculatis obtusis lateralibus" and, in the final note pointing out differences from *Serratula squarrosa*, he again referred to the same character: "calycibus squarrosis obtusis". The distinctive squarrose phyllaries point to a character from which many of the determinations of *Liatris scariosa* have varied.

There is in the Linnaean herbarium a specimen labelled *scari-*

osa which Linnaeus had at the time of writing his description, a photograph of which Professor Fernald kindly allowed me to see. Though not a complete plant (the tip of the inflorescence and the base of the plant being lacking) this shows twelve large heads ca. 1.5 cm. in diameter borne at the ends of pedicels about 3 cm. long, and the phyllaries are squarrose. The outermost ones are distinctly reflexed against the pedicels and the middle and inner ones to a slighter degree. All appear quite herbaceous and not at all scarious but rather slightly ciliolate on the margin. The leaves just below the lowest heads are oblanceolate, about 5 cm. long and 1.5 cm. wide, narrowing from the middle to a clasping base. Though the basal leaves are wanting on the specimen they would undoubtedly have been quite wide since a width of 1.5 cm. for an upper cauline leaf of *Liatris* is large. By use of a lens the rachis and leaves are seen to be pubescent.

Willdenow (Sp. Pl. iii. 1635 (1803)), when transferring this species to the genus *Liatris*, again emphasized the obovate squarrose phyllaries and added to the description of the inflorescence, a terminal leafy raceme, and to that of the leaves "utrinque attenuatis margine scabris". It is noteworthy that no mention of "scarious" phyllaries was made by any of the authors except Plukenet, whose phrase "floribus scariosis" is thus probably to blame for the name. Dr. H. K. Svenson,¹ who examined the Willdenow specimen and made drawings and notes, states: "bracts not particularly scarious, the scarious character perhaps referring to the fringe of hairs".

Though I have not seen the Clayton plant nor a photograph of it, there is in the National Herbarium a tracing of it, accompanying some correspondence by E. G. Baker in connection with determinations of specimens sent to him. When commenting on the plant from the Herb. Gronovius (British Museum Herb.) he noted: "(a) the bracts of the involucre are ciliate on the margin. (b) the bracts in the type are straight not folded. (c) the bracts do not tend to enlarge near the summit". The tracing shows 12 heads, almost hemispherical with the phyllaries erect, not reflexed, and the upper stem-leaves quite as wide as those in Linnaeus's plant. Thus, though the Gronovian plant does not perfectly match the Linnaean one and we are omitting it from the synony-

¹ Private communication.

my of *L. scariosa* var. *typica*, we believe it may represent what occurs abundantly in the mountains of Pennsylvania, Maryland, West Virginia and Virginia. Specimens from there have been examined that show the outer phyllaries to be herbaceous and spreading or but slightly reflexed, with the middle and inner ones a little scarious on the margin, less leathery than in *typica*, often colorful and also erect. The leaves vary from glabrous to asperous with basal ones very broad- to longer-oblongate and petiolate. Lunell described a plant from West Virginia, Aug. 27, 1903, K. K. Mackenzie, no. 363, White Sulphur Springs (I), as *Laciniaria scariosa* var. *virginiana* (Amer. Mid. Nat. ii. 172 (1912)), which he later renamed var. *borealis*, *ibid.* 264. It would seem to represent such a derivative. That there are slight variations in leaf- and especially in phyllary-characters can be seen by comparing the three specimens of the same date and number of the collector (I, NY, US), and a fourth (G) which has no number. While the type at the University of Indiana Herbarium has phyllaries quite ciliolate on the margins, the specimens at the National and Gray Herbaria have them hardly at all so, though in all three the phyllaries are erect. The specimen at the New York Botanical Garden, with rougher leaves and spreading phyllaries with only narrowly scarious, ciliolate margins, comes nearer *L. scariosa* var. *typica*. While other specimens have been seen that represent variations which perhaps may be combinations of parental characters of *L. scariosa* var. *typica* and *L. aspera* var. *glabra*, both of which occur in that range, there is nevertheless sufficient constancy found in these specimens of Mackenzie's to recognize their individuality and to relate them to *L. scariosa*. We have therefore retained Lunell's first varietal name and refer them to *Liatris scariosa* (L.) Willd. var. *virginiana* Lunell.

Michaux (Fl. Bor.-Amer. ii. 92 (1803)) described a species from South Carolina with lanceolate leaves, rough on the margin, and with outer phyllaries squarrose, calling it *Liatris squarrulosa* and in a note following the Latin description he stated that it seemed to be like *Serratula scariosa* but he wondered why, as Plukenet held, it should be called *scariosa*. From photographs of Michaux's type specimen and of a duplicate and rather better specimen, obtained by Mr. Weatherby, it seems to have been a

less robust, slender variety of the same species that is shown in the photograph of the Linnaean type. The heads are slightly smaller and the phyllaries more elongate than rounded but they are obtuse. The basal leaves are broadly, and the upper ones narrowly oblanceolate so that the whole plant strongly resembles the Linnaean one and we have no hesitancy in accepting its reduction to varietal ranking by Gray (Synopt. Fl. i². 110 (1884)) as *Liatris scariosa* var. *squarrulosa*. However, we do not accept the appended synonymy of *L. heterophylla* R. Br. (Ait. Hort. Kew. ed. 2, iv. 503 (1812)) which was described as having acute, lanceolate phyllaries. A photograph of that type specimen from the British Museum, a plant cultivated by Mr. William Malcolm, shows a plant with a very different involucre. Most striking are the long, pointed phyllaries. From a packet at the Gray Herbarium, containing the phyllaries of a fragmentary head of this specimen, from the Banks Herbarium, they were found to be very thin and glabrous as well as linear. Pursh (Fl. ii. 508 (1814)) when including a description of the species, after having seen the specimen, stated that the flowers were of the size of *L. graminifolia*, and he cited *L. varia* Herb. Banks ms. in synonymy. At the bottom of the sheet of *L. heterophylla* (Banks) there can be seen faintly written "*L. varia*" which undoubtedly explains this reference. When Torrey & Gray (Fl. ii. 75 (1841)) described the species by use of the then recently received head and additional notes supplied by Mr. Bennett, they concluded that, though resembling *L. scariosa* in size and shape of heads, it did not match even depauperate specimens of that species because of the pointed scales. As in the time of those writers, "apparently the species has not been subsequently met with in this country", and we leave it among the doubtful species.

18. *LIATRIS ASPERA* Michx. Corm rounded, irregular, subglobose, 2–5 cm. in diameter: stems frequently single, sometimes several, quite stout, 4–11 dm. high, glabrous below with scattered hairs above on the rachis of the flowering spike, to asperous over the entire stem-length; leaves mostly linear-lanceolate though frequently almost linear; the basal broader, 1–1.5 dm. long, 1–2 cm. wide, rhombic-lanceolate, narrowed into petioles of about half the total length, glabrous on both surfaces and lacking any marginal roughness, or asperous on one or both surfaces; upper leaves sessile, reduced to less than the length of the heads they

subtend: inflorescence a long open spike of usually more than 20 sessile to pedunculate somewhat globose, 25–40-flowered, heads 1.5–2.5 cm. in diameter; phyllaries all glabrous with exposed tips rounded and with broad scarious margins, and slightly bullate, middle and inner ones oblong-spatulate, to rounded and strongly bullate, giving the globose head a puckered appearance; corolla usually purple, rarely white, pilose within the tube at the base of the stamens, tube 8–10 mm. long; pappus 7–8 mm. long; achene 4–6 mm. long.—Fl. Bor.-Amer. ii. 92 (1803); Ell. Sk. ii. 276 (1822(?)); DC. Prodr. v. 130 (1836). *L. scariosa* sensu Sims, Curtis's Bot. Mag. t. 1709 (1815) not (L.) Willd. *L. sphaeroidea* sensu Sweet Br. Fl. Gard. 1 ser., t. 87 (1824); Shinnars, Amer. Mid. Nat. xxix. 34 (1943), not Michx. *Laciniaria aspera* Greene, Pittonia, iv. 318 (1901). *Liatris scariosa* Willd. f. *Benkii* Macb., Field Mus. Pub. Bot. iv. 127 (1927). *Liatris sphaeroidea* f. *Benkii* (Macb.) Shinnars, Amer. Mid. Nat. xxix. 35 (1933).

Var. **typica**. Stem rough-puberulent above or throughout with appressed or more or less incurved hairs: leaves asperous with dense, short, stiff hairs, linear-lanceolate, generally narrowly so.—*Liatris aspera* Michx. sens. strict. *Laciniaria scariosa* (L.) Hill vars. *porrecta* and *obesa* Lunell, Amer. Midl. Nat. ii. 159–162 (1912). *L. scariosa* vars. *virgata*, *strictissima* and *salutans* Lunell, Amer. Midl. Nat. ii. 169–177 (1912). *Liatris sphaeroidea* var. *salutans* (Lunell) Shinnars, Amer. Midl. Nat. xxix. 37 (1943). *Liatris sphaeroidea* forma *asperifolia* Shinnars, Amer. Midl. Nat. xxix. 36 (1943). *Lacinaria indecidea* and *Lacinaria stratiotes* Steele ex Winter, Analysis Flowering Plants of Nebraska, 143 (1936), Contrib. Bot. Surv. Neb. n. s. x. 143 (1936).

Central States from Ohio, Wisconsin, Minnesota and North Dakota southward to Louisiana, Oklahoma and Texas.—OHIO. LUCAS Co.: n. of Monclova, Aug. 8, 1924, Miss B. Garber (US). SCIOTO Co.: Friendship, Shawnee State Forest, D. Demaree, 11139 (NY). INDIANA. PORTER Co.: on the dunes, Dune Park, Sept. 17, 1909, E. S. Steele, 163a (G). JASPER Co.: open sandy places, Sept. 13, 1942, C. M. Ek (F). WISCONSIN. Co. undetermined: St. Helena, Aug. 1881, T. H. Bradwin (G). ONEIDA Co.: Manson, Sept. 1935, B. O. Dodge (NY). POLK Co.: dry ground, Rwy. right of way, St. Croix Falls, Sept. 4, 1927, N. C. Fassett & L. R. Wilson, 5453 (G). BROWN Co.: Preble (plant to left), Aug. 21, 1878, J. H. Schuette (G). PEPIN Co.: open dunes, lower terrace (albino), Aug. 27, 1927, N. C. Fassett, 4482 (G). JUNEAU Co.: abandoned field, 2 mis. s. of Matha, Aug. 27, 1937, J. W. Thomson (NY). SAUK Co.: on the cliffs, on the s. side of Devil's Lake, Aug. 30, 1909, E. S. Steele, 80 (G). WAUKESHA Co.: Nashotah, Aug. 24, 1884, R. N. Larrabee (G). GRANT Co.: Boscobel prairies (one plant), July 1886, C. H. Sylvester (NY). RACINE Co.: prairies, Sept. 8, 1882, H. E. Hasse (NY). ROCK

Co.: Clinton, along the Chicago & N. W. Rwy., Sept. 1, 1909, *E. S. Steele*, 96c (G), 96a (NY), 96b (US, 608836). MINNESOTA. PINE Co.: in sand at edge of forest, Highway 61, near Willow R., Aug. 10, 1938, *Miss O. Lakela*, 2726 (G). TODD Co.: dry sandy ground, Staples, Aug. 6, 1910, *Z. L. Chandonnet* (G); Staples, *Z. L. Chandonnet*, Aug. 18, 1914 (no. 307) (US), Aug. 9, 1911 (no. 4) (M, type of *Laciniaria scariosa* var. *porrecta* Lunell); (no. 1) (M, type of *Laciniaria scariosa* var. *obesa* Lunell). CHICAGO Co.: Center City, July 1892, *B. C. Taylor* (G, plant 1). STEARN Co.: St. Anthony, July 22, 1888, *J. H. Schuette* (NY). HENNEPIN Co.: Fort Snelling, Sept. 1888, *E. A. Mearns*, 141 (US); prairies, Fort Snelling Reservation, Sept. 21, 1907, *C. O. Rosendahl*, 2066 (G); Richfield, Sept. 1875, *N. H. Winchell* (NY). WABASHA Co.: sand prairie, about 2 mis. n. of Weaver, Sept. 28, 1930, *N. Hotchkiss & P. Jones* 4171 (US). GOODHUE Co.: Vasa, Aug. 1893, *A. P. Anderson* (US). LINCOLN Co.: Verdi, Aug. 1891, *E. P. Sheldon*, S1344 (M). ILLINOIS. Without stated locality: July, 1846, *S. B. Mead* (G). McHENRY Co.: Ringwood, *G. Vasey* (G). WINNEBAGO Co.: Fountaindale, *M. S. Bebb* (G, 281 US). JO DAVIESS Co.: Hanover, Aug. 18, 1908, *H. A. Gleason* (G). COOK Co.: Riverside, Aug. 1912, *J. M. Greenman*, 3831 (G); prairies, near Chicago City, Sept. 9–12, 1892, *Ohlendorf* (NY); vicinity of Chicago, Aug. 1909, *Miss Reynolds*, 2783 (NY, US). PEORIA Co.: dry sandy ground, Peoria, Aug. 1904, *F. E. Macdonald* (M, type of *Laciniaria scariosa* var. *strictissima* Lunell); dry sandy soil, Peoria, Aug. 1904, *F. E. Macdonald*, 1904 (G, NY); gravelly soil, Peoria, Sept. 3, 1908, *F. E. Macdonald* (G). McLEAN Co.: prairieland, Hendrix, Aug. 31, 1904, *B. L. Robinson* (G). CHAMPAIGN Co.: Champaign, by I. C. Rwy., Sept. 11, 1909, *A. S. Pease*, 12397 (G); Urbana, Sept. 25, 1900, *Miss M. L. Sheldon* (G); original prairies, Rantoul, Oct. 5, 1907, *F. C. Gates*, 2043 (US). MASON Co.: Topeka, Aug. 22, 1904, *H. A. Gleason* (G); Decatur, Sept. 1, 1939, *R. G. Mills* (NY). MORGAN Co.: vicinity of Concord, 2 mis. s. of Chapin, Sept. 1916, *Miss S. Pratt* (US). PIKE Co.: Rockport, Aug. 1904, *J. F. Clevenger* (US). IOWA. EMMETT Co.: Armstrong, Aug. 1890, *R. I. Cratty* (G); prairie, slope of Four Mile Creek, 3 mis. w. of Estherville, Aug. 13, 1934, *Miss A. Hayden*, 10535 (NY). FAYETTE Co.: prairies, Sept. 1894, *B. Fink* (G). CHEROKEE Co.: upland prairie slopes, 3 mis. s. of Cherokee, Sept. 5, 1937, *Miss A. Hayden*, 10537 (NY). HAMILTON Co.: dry prairie, along C. & N. W. Rwy., 2 mis. w. of Webster City, Sept. 13, 1933, *Miss A. Hayden*, 413 (NY). CARROLL Co.: Carroll, Aug. 29, 1896, *L. H. Pammel*, 38 (G, NY). JOHNSON Co.: prairies, Sept. 3, 1895, *M. F. Fitzpatrick* (I, type of *Laciniaria scariosa* var. *virgata* Lunell); Coralville, Sept. 3, 1909, *M. P. Somes* (US). POWESHIEK Co.: Grinnell, 1875, *M. E. Jones* (G, NY), Aug.–Sept.

1907, *Miss R. Drew* (G, NY, US 494671). DALLAS Co.: Redfield, Sept. 5, 1867, *J. A. Allen* (G). MISSOURI. Co. undetermined: prairies, Sept. 1838, *N. Riehl*, 10 (NY). ATCHISON Co.: dry ground, Oct. 1893, *B. F. Bush*, 199 (NY). ADAIR Co.: Kirksville, Sept. 5, 1883, *C. S. Sheldon*, 3505 (NY). MACON Co.: Ethel, Sept. 22, 1915, *B. F. Bush*, 7802 (US). JACKSON Co.: dry prairies, Martin City, Sept. 18, 1901, *K. K. Mackenzie*, 469 (NY, US); barrens, Dodson, Oct. 4, 1906, *B. F. Bush*, 4155 (G), 4159 (US); Dodson, Aug. 26, 1895, *B. F. Bush*, 242 (NY), Sept. 27, 1915, *W. W. Eggleston*, 12046 (NY); Sheffield, Sept. 6, 1896, *B. F. Bush*, 909 (US); prairies, Lee's Summit, Sept. 5, 1906, *B. F. Bush*, 4098 (G), 4097 (US). ST. LOUIS Co.: Allenton, Aug. 30, 1894, *G. W. Letterman* (NY, US). JOHNSON Co.: near Warrensburg, Nov. 5, 1916, *G. W. Stevens*, 4424 (NY). BARTON Co.: dry prairies, Golden City, Oct. 7, 1913, *E. J. Palmer*, 4593 (US). GREENE Co.: vicinity of Springfield, *P. C. Standley*, Aug. 21, 1912 (no. 9172) (US), Aug. 31, 1911 (no. 8569) (G, US), Aug. 1906 (US). BARRY Co.: Hailey, *J. W. Phillips* (G; US, Sept. 15, 1915). ARKANSAS. BENTON Co.: without stated locality, 1899, *E. N. Plank* (NY). NORTH DAKOTA. RICHLAND Co.: Hankinson, Aug. 25, 1902, *P. A. Rydberg*, 1151 (NY). SOUTH DAKOTA. ROBERTS Co.: hillsides, Aug. 1922, *W. H. Over*, 14357 (US). MARSHALL Co.:¹ mouth of St. Peter's River, Sept. 19, 1839, *C. A. Geyer*, Nicollet's N. W. Exped., 271 (US). GRANT Co.: virgin prairie, Clear Lake near Big Stone Lake, Aug. 1, 1940, *P. Johnson*, 69 (NY). SPINK Co.: Doland, Sept. 10, 1896, *L. W. Carter* (NY). BROOKINGS Co.: Lake Hendricks, Aug. 1906, *Miss F. N. Vasey* (G, US). YANKTON Co.: high knolls, Jamesville, Aug. 24, 1899, *L. A. Bruce*, 55 (US). NEBRASKA. Co. undetermined: prairies, Sept. 16, 1874, *O. Kuntze*, 2923 (NY). ANTELOPE Co.: Brunswick, Sept. 5, 1908, *N. F. Peterson* (US). SAUNDERS Co.: Mead's Ranch, Aug. 24, 1893, *F. Clements*, 2901 (G (US, type of *Lacinaria indecidea* Steele) N). HOWARD Co.: St. Paul, Aug. 29, 1919, *J. M. Bates* (G). CASS Co.: Weeping Water, Aug., *T. A. Williams* (US, 517526). LANCASTER Co.: Lincoln, 1906, *C. E. Bessey* (US), Aug. 1886, *H. J. Webber* (NY); Lancaster, Sept. 10, 1873, *S. Angley* (N, type of *Lacinaria stratiotes* Steele). SALINE Co.: Crete, *C. E. Brown* (US). KEARNEY Co.: Minden, Aug. 26, 1917, *Dr. H. Hapeman* (G). KANSAS. Co. undetermined: from Council Grove to Fort Leavenworth, Aug. 1847, *Plant. Nov. Mex.*, *A. Fendler*, 302 (333)² (G). RILEY Co.: prairie, Sept. 12, 1895, *J. B.*

¹ From Senate Report intended to illustrate a map of the Hydrographical Basin of the upper Mississippi River made by I. N. Nicollet, Feb. 16, 1841, Washington 1843, the place of this collection would seem to be about Marshall Co. just a little north of Day Co.

² In *Plant. Fendl.* A. Gray, 1849, page 63. specimen no. 302 is listed as *L. scariosa* Willd. and was collected from "Council Grove to Fort Leavenworth", Aug. 1847. The

Norton, 214 (G, US, NY); Manhattan, Sept. 12, 1892, *J. B. Norton* (NY). DOUGLAS Co.: Lawrence, *W. C. Stevens* (US). SHAWNEE Co.: Topeka, Summer, 1897, *Prof. Harshberger*, 3469 (US). LYON Co.: high prairies, 3 mis. n. of Madison, Sept. 18, 1941, *H. A. Stephens* (G). LINN Co.: grassy hillside, near Parker, Oct. 21, 1916, *G. W. Stevens*, 4341 (NY). COWLEY Co.: without stated locality, Aug. 22, 1898, *M. White* (NY). OKLAHOMA. OTTAWA Co.: in dry pasture, Ottawa, Aug. 29, 1913, *G. W. Stevens*, 2511 (G). NOWATA Co.: grassy roadside, Lenapah, Aug. 19, 1913, *G. W. Stevens*, 2176 (G). ROGERS Co.: 4 mis. n. of Catale, Oct. 9, 1938, *M. Hopkins & M. Van Valkenburgh*, 3678 (O). TULSA Co.: without stated locality, Autumn, 1926, *E. R. Force*, 13026 (O); dry railroad side, n. e. of Tulsa, Sept. 17, 1939, *U. T. Waterfall*, 1797 (O). PAYNE Co.: 6 mis. n. of Stillwater, Sept. 13, 1935, *E. E. Richardson* (O). MUSKOGEE Co.: Lot 4, Sept. 4, 1927, *E. L. Little*, 2227 (O). TEXAS. BASTROP Co.: Bastrop, Nov. 24, 1928, *B. C. Tharp* (NY), Oct. 1926, *H. H. Duval* (US). WALKER Co.: 14 mis. s. w. of Huntsville, Sept. 28, 1934, *V. L. Cory*, 10260 (G). HARRIS Co.: sandy soil near Houston, Aug. 21, 1903, *Biltmore Herb.* 2670e (US); Houston, Sept. 28, 1917, *E. J. Palmer*, 12786 (US); near Houston, Sept. 22, 1903, *Biltmore Herb.*, 2670j ((I, type of *Laciniaria scariosa* var. *salutans* Lunell) (US)); Houston, *G. L. Fisher*, Sept. 24, 1937 (no. 37160) (US), Aug. 23, 1915 (no. 1513) (US), Aug. 23, 1914 (no. 2032) (US), 1842, *F. Lindheimer* (G). GONZALES Co.: Cottonwood Springs, Sept. 7, 1933, *H. B. Parks*, 7682 (G).

Var. **intermedia** (Lunell), comb. nov. Stem glabrous below, with appressed hairs above on the rachis of the flowering spike; leaves glabrous or with but a few scattered hairs and frequently broadly lanceolate.—*Laciniaria scariosa* (L.) Hill var. *intermedia* Lunell, Amer. Mid. Nat. ii. 173, 177 (1912) = var. *media* Lunell ibid. 264 (1912). *Laciniaria scariosa* var. *petiolata* Lunell, Amer. Mid. Nat. ii. 172, 176 (1912). *Liatris sphaeroidea* of many authors, not Michx. Fl. Bor.-Amer. ii. 92 (1803). Probably *L. sphaeroidea* sensu Lodd. Bot. Cab. t. 1417 (1828), though description insufficient.

Occurring east of the Mississippi through North and South Carolina to Georgia and Florida, from Ontario through Indiana and Kentucky to Alabama and west of the Mississippi more generally in the southern central plains-states, Missouri, Arkansas, Louisiana, Texas and Oklahoma.—WEST VIRGINIA. RITCHIE Co.: Berea, dry hillside-field, Aug. 21, 1922, *L. F. & F. R. Randolph*, 1376 (G). NORTH CAROLINA. RUTHERFORD Co.: Hickory Nut Gap, Salola Mt., to Chimney Rock, Oct. 3, 1901, *J. K. Small & A. M. Huger* (NY). HENDERSON Co.: dry

same applies to (333), which bracketed number represents the number under which it was distributed.

woods, East Flat Rock, Sept. 15, 1926, *F. W. Hunnewell*, 10014 (G). MACON Co.: Yellow Mt., ex Torrey Herb., *Curtis* (NY). SOUTH CAROLINA. GREENVILLE Co.: Caesar's Head, Aug. 2, 1881, *J. D. Smith* (G); rocky woods, Caesar's Head, Aug. 12, 1881, *J. D. Smith*, 53 (US). GEORGIA. FLOYD Co.: without stated locality, *Chapman* (US). McDUFFIE Co.: sandhills, vicinity of Thomson, Sept. 9, 1908, *H. H. Bartlett*, 1491 (G, US); vicinity of Thomson, Sept. 7, 1907, *H. H. Bartlett* (US). FLORIDA. JACKSON Co.: Sneads, Aug. 19, 1942, *R. A. Knight* (F). ALACHUA Co.: high thin woods, Warrens Cave, Gainesville, Oct. 25, 1927, *Louchs, Miss L. Arnold & E. West* (F); dry roadside, Sugarfoot, Gainesville, Aug. 28, 1932, *Miss L. Arnold* (F). ONTARIO. LAMBTON Co.: Port Franks, Aug. 31, 1905, *C. K. Dodge* (G, US); sandy open ground near L. Huron, Port Franks, Sept. 2, 1929, *E. J. Palmer*, 36270 (G); near Sarnia, Aug. 18, 1892, *C. K. Dodge*, 11587 (Ot); rather low grounds, Point Edwards, July, 1887, *Burgess*, 9854 (Ot); Sarnia, Aug. 16, 1901, *J. M. Macoun*, 22614 (Ot); among small oaks, near Sarnia, Sept. 8, 1904, *C. K. Dodge*, 1 (Ot, US); 4 mis. s. of Grand Bend, Sept. 3, 1934, *H. H. Brown*, 4661, 4667 (HB); Grand Bend, Aug. 6, 1932, *Marie-Victorin, R. Germain & Jacques*, 49246 (To). KENT Co.: Squirrel Is., Aug. 31, 1904, *C. K. Dodge*, 2 (Ot, US). ESSEX Co.: woods, Sandwich, July 27, 1901, *J. M. Macoun*, 26615 (Ot); Point Pelee, Aug. 24, 1931, *H. H. Brown* (HB). MICHIGAN. Co. undetermined: Union Pier, Sept. 19, 1934, *Miss A. Fishman*, 231 (O). KEWEENAW Co.: without stated locality, Aug. 1889, *O. A. F.* (G). ST. CLAIR Co.: Fort Gratiot, ex Torr. Herb. *Dr. Pitcher*, 1829 (NY); near Port Huron, Aug. 30, 1892, *C. K. Dodge* (US). CALHOUN Co.: east of Albion, Aug. 9, 1906, *C. E. Barr* (G). ST. JOSEPH Co.: without stated locality, Sept. 2, 1838, *Houghton* (NY). OHIO. Without stated locality. *Herb. Schw.* (P). Co. undetermined: Margaretta Ridge, near Mt. Clemens, Sept. 25, 1904, *E. L. Moseley* (US). ERIE Co.: sand dune, Cedar Point, *R. J. Webb*, 5491 (G). LUCAS Co.: 10 mis. w. of Toledo, Sept. 2, 1897, *E. L. Moseley* (US). WOOD Co.: Plain twsp., Sect. 21, Aug. 10, 1937, *R. E. Shanks*, 2201 (NY). Ross Co.: Scioto Trails State Forest, dry wooded hills, Stoney Creek, Aug. 19, 1935, *D. Demaree*, 11532 (US). INDIANA. STEUBEN Co.: 1½ mi. n. of Clear Lake, Sept. 11, 1904, *C. C. Deam* (NY); sandy woods, e. side of Clear Lake, Sept. 11, 1904, *C. C. Deam* (M, type of *Laciniaria scariosa* var. *petiolata* Lunell). LA GRANGE Co.: high dry bank, e. side of Pretty Lake, Aug. 27, 1914, *C. C. Deam*, 14876 (G); on the bank of the Pigeon R., about 2 mis. e. of Ontario, Aug. 30, 1914, *C. C. Deam*, 15050 (US). PORTER Co.: sand dune, n. of Mineral Springs, Aug. 14, 1911, *C. C. Deam*, 9620 (M, type of *Laciniaria scariosa* var. *intermedia* Lunell); Dune Park, Sept. 4, 1906, *L. M. Umbach*, 1447 (US).

LAKE Co.: open sandy woods, Miller's, Sept. 20, 1914, *F. W. Johnson*, 1525 (NY); Buffington to Pine, old beaches "Lake Chicago", Sept. 20, 1901, *E. S. Steele*, 183 (US 609101); MARSHALL Co.: Indiana Harbour, Aug. 26, 1916, *C. C. Deam*, 21299 (G); copse near Lost Lake, Lake Maxinkuckee, Culver, Aug. 21, 1926, *J. R. Churchill* (G); Lake Maxinkuckee, 1899, *B. W. Evermann*, 1118 (US); sandy open knoll, outlet of Lost Lake, Plymouth, Sept. 3, 1909, *H. W. Clark* (US). STARKE Co.: sandy soil, along N. Y. C. Rwy., 1.3 mi. w. of North Judson, Sept. 6, 1941, *C. M. Ek* (G, NY). HARRISON Co.: Barrens s. e. of Corydon (albino), Sept. 5, 1836, *Mr. Clapp* (G). KENTUCKY. WHITLEY Co.: dry sand bank along Rwy., Cumberland Falls, Sept. 11, 1940, *F. T. McFarland*, 66 (G, NY). TENNESSEE. ROANE Co.: Malden's Ridge near Harriman, Aug. 20, 1903, *Biltmore Herb.*, 2670g (US). SEQUATCHIE Co.: dry conglomerate rocks, Cagle, Aug. 17, 1938, *H. K. Svenson*, 9659 (G). HAMILTON Co.: dry soil, Lookout Mt., Aug. 24, 1897, *Biltmore Herb.*, 2670 (NY, G) (US 957898, 332418); Lookout Mt., Sept. 6, 1877, *L. F. Ward* (US 134395). ALABAMA. Without stated locality: Sept. 1841, *ex Herb. G. Thurber*, *S. B. Buckley* (G). WISCONSIN. POLK Co.: St. Croix Falls, Aug. 13, 1900, *C. F. Baker* (G). BROWN Co.: Preble (plant to right), Aug. 21, 1878, *J. H. Schuette* (G). WAUSHARA Co.: Wild Rose, Aug. 8, 1919, *W. L. McAtee*, 3053 (US). JUNEAU Co.: 2 mis. s. of Mather, Aug. 27, 1937, *J. W. Thomson* (NY); Camp Douglas, Aug. 20, 1890, *E. A. Mearns*, 141 (NY); Camp Douglas (albino), Aug. 28, 1890, *E. A. Mearns*, 141 (US). SHEBOYGAN Co.: sandy ridges, s. of Sheboygan, Aug. 11, 1904, *L. H. Shinnors*, 2554 (NY). COLUMBIA Co.: Dells of the Wisconsin, Aug. 19, 1893, *Amer. Ass. Adv. Sci. Meet.* (NY). SAUK Co.: vicinity of Kilbourn, on Wisconsin R., Aug. 25, 1909, *E. S. Steele*, 11d (NY); on the cliffs, Devil's Lake, Aug. 31, 1909, *E. S. Steele*, 90b (NY); rocky ground, about Devil's Lake, Baraboo, Sept. 7, 1925, *E. J. Palmer*, 28383 (G). GRANT Co.: prairies, Boscobel (plant to left), July 1886, *C. H. Sylvester* (NY). MINNESOTA. ANOKA Co.: Moore Lakes, Sept. 5, 1926, *P. A. Rydberg*, 9673 (NY). ILLINOIS. COOK Co.: Lakeview, Sept. 7, 1882, *W. Deane* (G); prairie, near S. Chicago, Sept. 15, 1910, *O. E. Lansing*, 2858 (G, US); Chicago, *Dr. Scammon* (NY); vicinity of Palos Park, Sept. 6-7, 1909, *E. S. Steele*, 132a (US 672726). PEORIA Co.: exposed hillside, gravelly soil, Peoria, Sept. 3, 1908, *F. E. McDonald* (US 609908). MISSOURI. PIKE Co.: McCune, Aug. 25, 1916, *J. Davis*, 250 (US). JACKSON Co.: Dodson, Aug. 22, 1895, *B. F. Bush*, 242 (US). OZARK Co.: rocky open ground, near top of Bald Jesse, near Gainesville, Oct. 10, 1927, *E. J. Palmer*, 33071 (G). GREENE Co.: vicinity of Strafford, Aug. 27, 1912, *P. C. Standley*, 9478 (G). TANEY Co.: open rocky ground,

Malva, Sept. 17, 1924, *E. J. Palmer*, 26189 (G). ARKANSAS. Co. undetermined: Ozarks, on high banks along Frisco Rwy., Sept. 10, 1927, *A. Ruth*, 79 (US). FAULKNER Co.: dry hills, Quitman, Sept. 4, 1934, *D. Demaree*, 10950 (NY). LONOKE Co.: Carlisle, July 31, 1938, *D. Demaree*, 18012 (O); Pressure Reservoir, Hot Springs National Park, July 20, 1934, *H. R. Gregg*, 269 (US). YELL Co.: ridges, Mt. Nebo State Park, Aug. 30, 1939, *D. Demaree*, 20593 (G). GARLAND Co.: along Rwy., near Gulph Bridge, July 19, 1935, *F. J. Scully*, 374a (G); near Hot Springs, 1928, *R. Runyon*, 1179 (NY); summit of hills, Hot Springs, July 20, 1931, *R. Runyon*, 1500 (US). SEVIER Co.: Prairie de Queen Park, July 1937, *P. W. Beck* (O). DREW Co.: Monticello, Sept. 10, 1938, *D. Demaree*, 18297 (I); old fields 9 mis. s. of Monticello, Aug. 30, 1936, *D. Demaree*, 13574 (G, O). HEMPSTEAD Co.: Ozan, Aug. 25, 1937, *D. Demaree*, 15967 (O). MILLER Co.: Texarkana, Aug. 20, 1896, *A. A. Heller & E. G. Heller*, 4125 ((G, NY, US)). LOUISIANA. Co. undetermined: W. Louisiana, 1839, *Dr. Hale* (US). CADDO Co.: open dry field, along low woods, Pine Hill Rd., ca. 5 mis. n. w. of Shreveport, Aug. 6, 1938, *D. S. Correll & H. B. Correll*, 10090 (NY). OKLAHOMA. MAYES Co.: dry hillside pasture, Adair, Sept. 2, 1913, *G. W. Stevens*, 2581 (G, NY). TULSA Co.: Tulsa, Oct. 30, 1913, *G. W. Stevens*, 2989 (G). CREEK Co.: Arkansas R., Aug. 21, 1895, *J. W. Blankinship* (G). MUSKOGEE Co.: Lot 1, July 23, 1927, *E. L. Little*, 1903 (O); Lot 3, Sept. 7, 1927, *E. L. Little*, 3127 (O); 2 mis. w. of Muskogee, Aug. 8, 1926, *E. L. Little*, 257 (O); near Muskogee, Sept. 25, 1896, *L. F. Ward*, 10 (US). HUGHES Co.: prairie, Aug. 26, 1938, *C. C. Smith* (O). SEMINOLE Co.: Seminole (albino), July 21, 1936, *M. Hopkins & D. Demaree*, 48 (O). LE FLORE Co.: Stapp, Aug. 25, 1937, *D. Demaree* (O); in open woods, in mt. valley, Page, Sept. 9, 1913, *G. W. Stevens*, 2714 (G); on s. side of Rwy. embankment, near Page, Sept. 8, 1913, *G. W. Stevens*, 2627 (G, NY). LATIMER Co.: Wilburton, Aug. 10, 1930, *O. M. Clark* (O). PITTSBURG Co.: McAlester, Aug. 8, 1894, *C. S. Newhall* (G). TEXAS. GRAYSON Co.: Denison, Sept. 13, 1906, *F. J. Tyler* (US). GREGG Co.: without stated locality, Autumn, 1941, *C. L. York* (G). HARRIS Co.: Houston, 1842, *Lindheimer* (G). WALLER Co.: Hempstead, Aug. 28, 1932, *B. C. Tharp* (G).

This species is widely distributed but has not always been accepted, having been referred to *L. scariosa* by Torr. & Gray (Fl. N. Am. ii. 75 (1841)) and again by Gray (Synop. Fl. 1². 110 (1884)). Examination of a photograph at the Gray Herbarium of the type specimen collected by Michaux in the "Illinois meadows", though not showing a complete plant, made it possible

to determine the nature of the phyllaries. The outer ones are recurved, the middle and inner ones have rounded or spatulate tips with broad petaloid margins and are clearly crisped. In pressing, these have sometimes been folded back on themselves or left concave and cup-like. The upper cauline leaves are linear-lanceolate with acute tips. As Greene, who recognized this species under *Laciniaria* (Pittonia, iv. 318 (1901)) stated, it is difficult "to understand on what principle a plant so well marked as this could be confused . . . with *L. scariosa*". From the type of that species it is easily known by the middle and inner, glabrous, broadly scarious, bullate phyllaries, rather than herbaceous, squarrose ones, and by the acute lanceolate, rather than oblanceolate, leaves.

Michaux had given Illinois as the type locality for this species. From the account in his journal (Proc. Amer. Phil. Soc. xxvi. 129 (1888)) and the map of F. A. Michaux¹, Illinois would be as far west as he had travelled and would refer to the region east of the Mississippi, there being no Indiana at that time. Plants with the familiar puckered heads of the *aspera* type are now known to occur from southern Ontario, Michigan and Ohio south to the Carolinas and southwestward to Louisiana, Texas and Oklahoma. When leaves of specimens from Illinois southward and westward are examined it is found that some are rough, some glabrous and some of varying degrees of intermediacy of pubescence. In contrast, the southeastern specimens, from the mountains of Tennessee to South Carolina, Alabama and Florida, are more constantly glabrous. To the author, therefore, it seemed best to broaden Michaux's conception of the species to allow for leaves from very rough to very smooth and to consider them as two varieties, the typical and the glabrous respectively. The lists of specimens so separated show the range of the former from Wisconsin, Indiana and Illinois westward while the latter extends eastward, as well, into Kentucky and the Carolinas and from there southward into Alabama and Florida.

When examining the types of Lunell's numerous varieties of *Laciniaria scariosa* it was found that two of the seven (see also no. 20), namely var. *intermedia* (which was later called *media*) and var. *petiolata*, both from Indiana, come under the glabrous

¹ Travels to the westward of the Alleghany Mountains. J. Mawman (1805).

variety of *L. aspera* Michx. as here interpreted. Lunell's earlier name *intermedia* takes precedence in this new varietal combination, which has been made on the basis of the characters of his type and not upon the characters described and classified by him. The glabrous *Liatris sphaeroidea* of Michaux, however, is not included in synonymy.

Michaux (l. c.) described *L. sphaeroidea* as having smooth leaves, pedunculate flowers and oval erect bracts and gave as habitat the high mountains of Carolina as well as the meadows of Illinois. The identification and delimitation of *L. sphaeroidea* and *L. aspera* has been a perplexing matter. Comparison of the photographs of Michaux's two plants seen at the Gray Herbarium, reveals similar inflorescences of large heads in loose racemes, though they are sessile in the latter and short-pedunculate in the former. Since within other species all conditions from sessile to pedunculate heads occur, that character is not diagnostic. The phyllaries, however, are of different shapes and quite differently disposed in the two specimens. The outer ones of *L. sphaeroidea* are outspread but hardly recurved. The middle and inner ones are erect, elongate, oblong and slightly spatulate at the tip, with narrow scarious borders, some just a little crisped but none really concave as in *L. aspera*. As stated above, Michaux referred to smooth leaves in *L. sphaeroidea* in contrast to very rough ones in *L. aspera* and gave it a habitat in the high mountains of Carolina as well as in the meadows of Illinois.

Careful search for specimens resembling Michaux's type of *sphaeroidea* in the characters of the head and phyllaries, rather than just in smooth leaves or pedunculate heads, shows a great many from around the Great Lakes region. Since on the label of Michaux's type-specimen occurs "Prairies vers Mississippi" it seems that there may be some justification for the interpretation of his species being like many of those of the Great Lakes Basin. Where it occurs along with *L. aspera*, as it does among the pine-oak scrub on the sand-ridges of the southeastern shore of Lake Huron in Ontario, it is often difficult to be sure of the determination, especially when it has grown under particularly unfavorable circumstances or during unusually dry summers. To this author, *L. sphaeroidea* occurring as glabrous, semi-hirsute and hirsute plants, comes very close to and is perhaps

some hybrid of *L. aspera* Michx. Whether it may have arisen originally in the more central northern region as an intermediate between *L. aspera* and *L. ligulistylis* we cannot say.

L. aspera Michx. is undoubtedly the species of widest geographic range of the *Scariosae* series and is therefore responsible for many confusing mid-forms. At the northwestern limit of the range of *L. aspera*, as in Wisconsin, Minnesota and North Dakota, it meets *L. ligulistylis*. From this species, with fewer large heads and erect, lacerate phyllaries, it is clearly distinguishable. The presence of pilosity in the corolla-tube of *L. aspera* and its absence in *L. ligulistylis* makes a very satisfactory additional character for confirmation of the separation of the two. On this basis seven of Lunell's varieties of *Laciniaria scariosa* have been transferred to *L. aspera* (five under var. *typica* and two as var. *intermedia*), while nineteen others were included under *L. ligulistylis*. Intergradations between the two species, however, are numerous and varied and eight of these were recognized also among Lunell's *scariosa* varieties (see no. 20). With all the recombinations of leaf-, stem-, head-, phyllary- and corolla-tube-characters, these intermediate specimens, found mostly west of Lake Michigan, are nevertheless distinguishable by the generally larger and more hemispherical mature heads from the segregate that we have interpreted as \times *L. sphaeroidea* Michx. of the Great Lakes region with smaller, more campanulate or globular heads. That they more nearly resemble *L. aspera* can be judged by the confusion of interpretation seen in various authors' lists of synonyms. By contrast, \times *L. Neiuwlandii* (Lunell) Shinnars (see no. 20) has a recognizably stronger relationship to *L. ligulistylis* and may represent a more recent derivative.

That no specimens of \times *L. sphaeroidea* are here listed as occurring in the high mountains of Carolina, which were included along with the meadows of Illinois as the habitat, may perhaps be due to Michaux having casually matched his specimen by its glabrosity with the variety of *L. aspera* to be found in that region (var. *intermedia*), without giving weight to the differences he noted in the phyllaries of the two species he described. There might also have been specimens of the *L. scariosa* var. *virginiana* that Michaux saw occurring in those mountains, with the phyllaries less reflexed and with slightly more scarious margins than in

variety *typica*, for he certainly thought of *L. scariosa* as having wholly herbaceous phyllaries; to wit his observation under *L. squarrulosa* "Videtur SERRATULA scariosa L. non autem video cur, Pluknetio duce, scariosam dixerit." Examination of Michaux's herbarium for any further specimens from the Carolina region would certainly be interesting and might help final elucidation of this alliance, which has been so variously interpreted.

Laciniaria Deamii Lunell (Amer. Mid. Nat. ii. 169 (1912)), described from a plant of C. C. Deam, no. 1747, from the base of open dunes, just south and east of Indiana Harbor, Lake Co., Ind. (I), can be included under this interpretation of \times *L. sphaeroidea* because of the wholly glabrous phyllaries, petaloid on the margins and a little crisped, and the campanulate heads of about thirty flowers. Examination of N. C. Fassett, no. 21207, from Bear Lake, Wolf Lake, Noble Co., Ind., Sept. 11, 1941 (W), which by Shinnars (Amer. Mid. Nat. xxix. 31 (1943)) was made the type of \times *L. Deamii* (Lunell) Shinnars f. *albina*, showed marked differences from Lunell's type, aside from the flower-color, in the almost wholly herbaceous and somewhat pubescent phyllaries and the few (8 fully developed) large heads of 45-50 flowers. Like it, a plant of normal color, no. 21208, collected at the same time and place by N. C. Fassett, in the large terminal heads seems rather to show relationship to \times *L. Nieuwlandii*, the type of which was described from Indiana.

That \times *L. sphaeroidea* has a stable identity is judged from the number of times it has probably been one of the parents in other recognized hybrids. It has seemed to cross with species of two other series including one of each other section, as with *L. spicata* of the *Spicatae* series in the production of \times *L. Steelei* (see no. 1) and with *L. cylindracea* of the *Cylindraceae* series and section *Euliatris* in \times *L. Gladewitzii* Farwell (see no. 31).

\times LIATRIS SPHAEROIDEA Michx. Rootstock irregular, subglobose, 2-5 cm. in diameter: stems one or few, 4-11 dm. high, from glabrous to asperous as in *L. aspera*: leaves glabrous, somewhat pubescent or asperous, linear-lanceolate, the basal 1-1.5 dm. long and ca. 1 cm. wide, subpetiolate, reduced upwards to narrowly lanceolate ones not much longer at the base of the inflorescence than the heads subtended: inflorescence a raceme or panicle of numerous, 20-40, sessile or pedicellate heads of 25-40 flowers: heads barely globose (when young cylindrical-campanulate)

with phyllaries only slightly bullate or crisped, all loosely erect; outer ones obovate or oblong with slightly spatulate and scarious-margined tips, middle ones more elongate and with the spatulate ends still scarious-margined and only slightly crisped; corolla usually purple, sometimes pale mauvish pink, rarely white; tube ca. 9 mm. long, pilose within; pappus 7–8 mm. long, barbellate; achene 4–5 mm. long.—Fl. Bor.-Amer. ii. 92 (1803). Ell. Sk. ii. 281 (1822?); DC. Prodr. v. 130 (1836); not *L. sphaeroidea* sensu Shinnars, Amer. Mid. Nat. xxix. 35 (1943). *Suprago sphaerocephala* Cass. Dict. li. p. 386 (1827). *Laciniaria Deamii* Lunell, Amer. Mid. Nat. ii. 169 (1912). *Liatris scariosa* var. *Deamii* Peattie, Amer. Mid. Nat. x. 132 (1926). × *Liatris Deamii* (Lunell) Shinnars, Amer. Mid. Nat. xxix. 31 (1943), in part.

Southern Ontario to Minnesota and Nebraska, south to Tennessee and Arkansas.—ONTARIO. LAMBTON Co.: dry poor soil, Walpole Is., Sept. 24, 1909, *C. K. Dodge* (US). ESSEX Co.: in open woods, Leamington, July 30, 1892, *J. M. Macoun*, 22769 (plant to left) (Ot). MICHIGAN. DELTA Co.: in jack pines, near Rapid R., Aug. 19, 1933, *F. C. Gates*, 17430 (US). ST. CLAIR Co.: dry sandy soil, near Port Huron, Aug. 10, 1896, *C. K. Dodge* (US); Lakeside Cemetery, Port Huron, Aug. 28, 1904, Aug. 23, 1911, *C. K. Dodge* (US). INGHAM Co.: along roadside in sand, Haslet, Aug. 30, 1917, *T. G. Yuncker*, 723 (US). OHIO. Co. undetermined: top of dry cliff, Ross Hollow, Sept. 27, 1936, *Bartley & Pontius*, 152 (NY). ERIE Co.: Cedar Point, Oct. 8, 1904, *E. L. Moseley* (US). LUCAS Co.: Spencer Twsp., sandy soil, Sept. 26, 1921, *E. L. Moseley* (US); several mis. n. w. of Whitehouse, Aug. 28, 1927, *E. L. Moseley* (US). INDIANA. STEUBEN Co.: in sandy wood, e. side of Clear Lake, Aug. 21, 1904, Sept. 9, 1904, *C. C. Deam* (G). PORTER Co.: Dune Park, Sept. 2, 1898, *L. M. Umbach* (US 609933); Dune Park, Sept. 17, 1909, *E. S. Steele*, 160 (G, US 609009); on and among dunes. Dune Park, Sept. 17, 1909, *E. S. Steele*, 162b (US 609017). LAKE Co.: near L. Michigan, about $\frac{1}{4}$ mi. from lake-front, 1906, *C. C. Deam*, 1747 (US); sandy pine ridges, Pine, Sept. 28, 1910, *O. E. Lansing*, 2889 (G); Indiana Harbor, Sept. 15, 1909, *E. S. Steele*, 150b (US 608997); 153b (US 609044); base of open dunes, just s. & e. of Indiana Harbor, Sept. 23, 1906, *C. C. Deam* (I, type of *Laciniaria Deamii* Lunell); Hammond, old beaches, "Lake Chicago", Sept. 14, 1909, *E. S. Steele*, 143a, 146a, 146c (G); Sept. 18, 1909, *E. S. Steele*, 174a (US 609078); Buffington to Pine, old beaches "Lake Chicago", Sept. 20, 1909, *E. S. Steele*, 184a (US 609014), 184c (G, US 609106), 151c (US 672715), 180b (G), 180g (US 699097), 189e (G, US 609127), 189f (G), 187a (G, US), 188b (G, US 609123). KENTUCKY. ROWAN Co.: prairie patch, Clack Mt., Sept. 27, 1936, *Miss E. L. Braun* (G). TENNESSEE. KNOX Co.: vicinity of Knoxville, Sept.

18, 1890, *F. Lamson-Scribner* (US). WISCONSIN. BURNETT Co.: dry sandy ground n. of Danbury, Aug. 26, 1940, *L. H. Shinnors & J. Catenhuse* 2836 (G). BROWN Co.: Preble (plant to right), Aug. 21, 1878, *J. H. Schuette* (G). SAUK Co.: rocky ground, about Devil's Lake, Sept. 7, 1925, *E. J. Palmer* 28383 (G); Devil's Lake, Aug. 15, 1881, *J. M. Holzinger* (US); eastern range of cliffs, Devil's Lake, Aug. 31, 1909, *E. S. Steele*, 90c (US 608814), 90e (US 608812), 90h (US 608817); vicinity of Kilbourn, Aug. 30, 1909, *E. S. Steele*, 79 (US); dry sandy bluffs of river, vicinity of Kilbourn, Aug. 25, 1909, *E. S. Steele*, 11b (US 619845), 11c (US 608703). MINNESOTA. ITASCA Co.: sandy soil, Grand Rapids, Aug. 1891, *J. H. Sandberg*, 741 (US). OTTER TAIL: sandy soil, Richdale, Aug. 13, 1912, *Z. L. Chandonnet*, 0.1 (US); sandy hills, Richdale, Aug. 28, 1913 (no. 136), Aug. 12, 1914 (no. 280) *Z. L. Chandonnet* (US); TODD Co.: dry sandy soil, Staples, Aug. 19, 1912, *Z. L. Chandonnet*, 19, 25, (US); sandy soil, Staples, Aug. 22, 1913, *Z. L. Chandonnet*, 130 (US). CHISAGO Co.: Center City, July 1892, *B. C. Taylor*, plant 2 (G). ILLINOIS. COOK Co.: pebbly clay of Valparaiso moraine, vicinity of Palos Park, Sept. 6-7, 1909, *E. S. Steele*, 132a (US 608918), 133 (US 608929); Rogers Park, old beaches, "Lake Chicago", Sept. 4, 1909, *E. S. Steele*, 105 (G, US 608862), Sept. 10-11, 1909, 141a (US 608960), 140 (G, US 608966); dry open woods, sand dunes, Miller's, Sept. 4, 1911, *E. E. Sherff* (G). IOWA. FAYETTE Co.: prairies, Sept. 5, 1894, *B. Fink*, 617 (US). CHEROKEE Co.: ca. 3 mis. s. of Cherokee, on upland slopes, Pilot Twsp., Sect. 23, Sept. 5, 1937, *Miss A. Hayden*, 10537 (G). JOHNSON Co.: without stated locality, Sept. 9, 1909, *M. P. Somes*, 3873 (US). ARKANSAS. CARROLL Co.: dry hillsides, Eureka Springs, Sept. 20, 1913, *E. J. Palmer*, 4404 (US). NEBRASKA. PIERCE Co.: Plainview, Sept. 7, 1908, *W. F. Petersen* (US). KANSAS. SHAWNEE Co.: Topeka, Aug. 22, 1877, *E. A. Popinoe* (US).

× LIATRIS WEAVERI Shinnors (*L. aspera* × *punctata*). Stems slender, 12-24, from an elongate, penetrating rootstock ca. 10 cm. long, 4-5 dm. tall, mostly glabrous but with some whitish pubescence along the upper part of the flowering stalk and bearing many, punctate, linear to narrowly linear-lanceolate leaves as in *L. punctata*; lower ones 15 cm. long, 0.5-1 cm. wide, reduced gradually upwards to bracts exceeding the basal heads: inflorescence 15-30 cm. long, dense and spike-like; heads numerous, campanulate to turbinate, 1.5-2 cm. long and 1-1.5 cm. wide, 12-15-flowered; phyllaries linear-lanceolate, erect and moderately loose; outer ones herbaceous oblong or somewhat triangular with acute tips, 5-7 mm. long; middle and inner ones up to 1.5 cm. long and 3-5 mm. wide, oblong, blunt at tip, with a narrow scarious, erose, paler margin; corolla purple, 9-11 mm. long,

quite pilose within; achenes ca. 5 mm. long; pappus 8 mm. long and plumose.—Amer. Mid. Nat. xxii. 38 (1943).

The type of this hybrid was one plant (no. 16) of a seedling population grown from seeds (received in 1926, from Dr. E. J. Weaver and collected from uplands near Lincoln, Lancaster Co., Neb.) in 1927 at Crediton, Ontario by L. O. Gaiser. Plants no. 4 and 17, also mentioned in the description by Shinnars (l. c.), were of the same and of the 1928 population respectively grown likewise from seeds of the same package. Both Dr. Weaver and myself are at a loss to explain the location "Locarina, Nebraska" given for the type specimen by Shinnars. Other specimens from the same plants are now placed in the Gray Herbarium.

The rest of the seedlings grown during the two successive years 1927 and 1928 were quite like the herbarium specimens of *L. aspera* Michx. var. *typica* received along with the seeds. Herbarium specimens and a package of seeds of *L. punctata* that were received from Dr. Weaver at the same time, from the same locality, proved to be variety *nebraskana*, having the characteristic narrow leaves, lacking prominent cilia on the margin and the slender heads with narrow, lanceolate phyllaries, also without marginal cilia. Thus it seems very probable that the three seedlings were the result of hybridization in the field of *L. aspera* var. *typica* and *L. punctata* var. *nebraskana*. As Shinnars understood *L. sphaeroidea* in the same sense as *L. aspera* var. *typica*, as used here, the parentage given above is really the same as that given by him.

These hybrids resemble *L. punctata* var. *nebraskana* in the tufted, numerous, slender stems, much shorter than those of *L. aspera* seedlings growing alongside, in the numerous punctate, linear leaves, the shorter, dense, spike-like inflorescence and the plumose pappus. In the pubescence along the upper part of the stem, the campanulate to turbinate heads of 12–15 flowers with phyllaries that are loosely erect, having the middle ones broader, narrowly scarious and blunt-tipped, and the length of the achene they resemble *L. aspera*.

From viable seeds collected from each of the three seedling plants, F² populations were grown. They were indeed a mixed lot showing sometimes greater resemblances to *L. aspera* and sometimes to *L. punctata*.

19. *LIATRIS SCABRA* (Greene) K. Schum. Stems straight, stiff, from a somewhat rounded corm 2 cm. or more in diameter, covered with retrorse hairs and distinctly scabrous, generally 6–9 dm. high, bearing about 20–30 usually short-peduncled heads in an open spike, rarely becoming paniculate: leaves scabrous on upper and lower surfaces, the lower 10–15 cm. long and 10–25 mm. wide, oblanceolate, narrowing to a winged petiole less than half the length of the blade; upper leaves bluntly lanceolate, 4–5 cm. long and 5 mm. wide, non-petiolate and with clasping base, tending to diverge from the stem at right angles: inflorescence of 20–35-flowered heads, ca. 2 cm. long and 1.5–2 cm. wide when flowers are open, somewhat cylindrical to turbinate, frequently all on short pedicels or with the basal becoming long-pedunculate; phyllaries entirely herbaceous and green, densely pubescent with short hairs or scabrous, margin ciliolate, the outer ovate to acute and sometimes recurved, the inner and middle oblong-obovate, spatulate with almost orbicular tips, generally erect and appressed without any or with hardly any colored rim; corolla-tube pilose within, 10–15 mm. long; pappus 8–10 mm. long; achene ca. 5 mm. long.—Just, Bot. Jahresb. xxix. 569 (1903). *Laciniaria scabra* Greene, Pittonia, iv. 317 (1901). *Laciniaria Shortii* Alex. in Small, Man. S. E. Fl. 1335 (1933) in part. *Liatris aspera* sensu Shinnery, Amer. Mid. Nat. xxix. 34 (1943), not Michx.—Ohio and Illinois to Alabama and Mississippi, and westward into Arkansas and Oklahoma.—OHIO. Without stated locality, 1842, C. W. Short (NY, type of *Laciniaria Shortii* Alex.). ERIE Co.: Castalia prairie, Sept. 19, 1909, E. L. Moseley (US). OTTAWA Co.: Port Clinton, Aug. 13, 1895, E. L. Moseley (G, US); Catawba Isl., Sept. 5, 1897, E. L. Moseley (US); between Port Clinton & Catawba Isl., Aug. 13, 1895, E. L. Moseley (US). FRANKLIN Co.: Georgesville, Aug. 29, 1892, W. C. Werner (NY). INDIANA. CASS Co.: along rwy., 1 mi. e. of Lake Cicott, Aug. 16, 1940, C. M. Ek (NY). VIGO Co.: without stated locality, W. S. Blatchley (US). BROWN Co.: crest of open wooded knob, ca. 9 mis. s. e. of Nashville, Oct. 10, 1935, C. C. Deam, 56936 (G). JACKSON Co.: open chestnut oak ridge, 4 mis. n. w. of Medora, Sept. 4, 1934, R. M. Kriebel, 3022 (G). WASHINGTON Co.: s. slope of Quercus ridge, 12 mis. n. of Salem, Oct. 5, 15, 1916, C. C. Deam, 22461 (US). HARRISON Co.: sterile wooded slope, ca. 3 mis. n. of Elisabeth, Oct. 16, 1917, C. C. Deam, 24374 (US); s. slope of Elisabeth Hill, 3 mis. e. of Elisabeth, Oct. 13, 1916, C. C. Deam, 22429, 22432 (US). KENTUCKY. Co. undetermined: barrens of Kentucky, Sept. 1835, C. W. Short (G). BULLITT Co.: Shepherdsville, Sept. 3, 1903, Biltmore Herb., 2670f (US). EDMONSON Co.: dry woodlands, near Mammoth Cave, Sept. 21, 1903, Biltmore Herb., 2670i (US). MISSISSIPPI. OKTIBBEHA Co.: Starkville, Oct. 1, 1889, S. M. Tracy (US).

ILLINOIS. Co. undetermined: pine hills, Sept. 23, 1890, *F. S. Earle*, ND, type). ARKANSAS. PULASKI Co.: north of White City Park, Little Rock, Sept. 19, 1931, *D. Demaree*, 8200, 8211 (US); open dry woods, Pulaski Heights, Little Rock, Sept. 15, 1931, *D. Demaree*, 8172 (G, NY, US); near White City Park, road to Quarry, Little Rock, Sept. 30, 1931, *D. Demaree*, 8333 (US). GARLAND Co.: dry slopes of West Mt., Hot Springs, Oct. 15, 1925, *E. J. Palmer*, 29229 (NY); dry woods, Sleepy Water Rd., Hot Springs, Sept. 8, 1935, *F. J. Scully*, 500 (G). JEFFERSON Co.: open pine-oak-hickory ridge woods, Pine Bluff, Oct. 1, 1942, *D. Demaree*, 24099 (G). CLARK Co.: high, dry, rocky wooded hill, Oct. 28, 1932, *D. Demaree*, 10001 (NY). ASHLEY Co.: knolls in open woods, Hamburg, Sept. 27, 1937, *D. Demaree*, 16351 (NY); prairie-like regions, Fountain Hill, Oct. 11, 1937, *D. Demaree*, 13919 (O). LOUISIANA. NATCHITOCHEs Co.: dry open woods, Natchitoches, Oct. 3, 1915 (no. 8799), Oct. 7, 1917 (no. 8888), *E. J. Palmer* (US). RAPIDES Co.: pinelands, Sept. 10, 1900, *Biltmore Herb.*, 2670n (US), Alexandria, *Dr. Hale* (NY), Alexandria, *J. Hale* (NY). OKLAHOMA. LE FLORE Co.: severely cut pine-oak woods, Kiamichi Mts., July 17, 1930, *E. L. Little & C. E. Olmstead*, 603 (O). PUSHMATAHA Co.: open areas in oak forest, Aug. 27, 1938, *C. C. Smith*, 918 (O).

This species is quite unlike *L. aspera* Michx. in the densely scabrous stem and leaves, and the herbaceous, green, pubescent to scabrous phyllaries, non-scarious on the margin and mostly erect and appressed, or with only the outer ones squarrose, and none crisped or bullate. However, plants with involucre and leaf-characters intermediate between these two species have been seen from Indiana, Arkansas and Kansas, which are in the range of both; e. g. Oct. 10, 1935, *C. C. Deam*, no. 56936, from 9 mis. e. of Nashville, Brown Co., Indiana (G); Sept. 12, 1895, *J. B. Norton*, no. 214, from prairie, Riley Co., Kansas (G), and Oct. 28, 1932, *D. Demaree*, no. 10001, from Amity, Clark Co., Arkansas (G), though the specimen of the last collector's number and date at the New York Botanical Garden seems more nearly to resemble *L. scabra*.

L. scabra can be differentiated from *L. scariosa* by the arrangement of the phyllaries as well as the shape of the leaves; in *L. scariosa* of the Eastern States the basal leaves are broadly obovate. However, it is not difficult to think of *L. scabra* as a modification of *L. scariosa* as it travelled westward. In fact it was rather startling to see how very much the heads and phyllaries

of the Oklahoma plants from the Kiamichi Mts. resembled those of *L. scariosa* from the southern Appalachian Mts.

20. LIATRIS LIGULISTYLIS (Nels.) K. Sch. Corm shallow, rounded, 1–4 cm. in diameter: stems single or several, 1–6 dm. high, glabrous below with white appressed pubescence on the usually reddish flowering stem or pubescent in most parts: leaves varying from glabrous to sparingly hispidulous along mid-vein of lower surface or to densely pubescent on both surfaces but always with cilia on the margin; basal leaves lanceolate-oblong or oblanceolate, 8–15 cm. long and 1–1.5 cm. wide, usually with a long margined petiole (the radical sometimes 20–40 cm. long); leaves reduced abruptly upwards, there more lanceolate, bract-like along a kind of strict spike: inflorescence of comparatively few heads (1–15) on short peduncles 1–5 cm. long, with the terminal head often much larger than the others, with varying conditions of moisture and soil the inflorescence bearing more heads with longer peduncles: heads broadly campanulate, becoming hemispheric, 2–3 cm. wide, 40–70-flowered (terminal one sometimes twice that size); phyllaries glabrous, erect, with less rounded, more irregular, spatulate, broadly lacerate, scarious, usually colored tips, (sometimes the outer phyllaries of older heads appear to have been pressed out and backwards by the expansion of the maturing heads but in young heads are always erect); all phyllaries quite similar in texture though outer ones shorter, oblong, ovate or orbicular; middle and inner ones spatulate-oblong; corolla-tube nonpilose within, but occasionally a few hairs on the outside of base of tube, 9–11 mm. long; pappus 8–10 mm. long, smoky purple when mature; achene 5–6 mm. long.—Just, Bot. Jahresb. xxix¹. 569 (1903). *Laciniaria ligulistylis* Nels. Bot. Gaz. xxxi. 405 (1901). *Liatris Rosendahlia* Rydb. Brittonia, i. 100 (1931), not sensu Shinnars, Amer. Midl. Nat. xxix. 40 (1943). *Liatris Haywardii* and *L. Herrickii* Rydb. (the latter a depauperate specimen) op. cit. i. 99 (1931). *Laciniaria formosa* Greene, Leaflets, i. 145 (1905). *Laciniaria scariosa* (L.) Hill var. *corymbulosa* Sheld. Bull. Geol. & Nat. Hist. Surv. Minn. ix. 77, t. vi (1894), in part = forma *corymbulosa* Sheld. Quart. Bull. Univ. Minn. i. 27 (1892). *Laciniaria scariosa* vars. *basilaris*, *supereminens*, *praeceps*, *praestans*, *multiplex*, *perusta*, *angustata* and *opima* Lunell, Amer. Mid. Nat. ii. 92 (1911). *Laciniaria scariosa* var. *scalaris* Lunell, Amer. Mid. Nat. ii. 127 (1911). *Laciniaria scariosa* var. *subcorymbosa* Lunell, Amer. Mid. Nat. ii. 158–9 (1912). *Laciniaria scariosa* forma *uniflora* Sheldon, Quart. Bull. Univ. Minn. i. 27 (1892), probably. *Laciniaria scariosa* var. *uniflora* Lunell, Amer. Mid. Nat. iii. 344 (1914). *Laciniaria scariosa* vars. *exuberans*, *singularis*, *immanis*, *crista-galli*, *insolens*, *composita*, *annuens* Lunell, Amer. Mid. Nat. v. 31–

46 (1917). *Laciniaria scariosa* var. *inconcinna* Lunell, Amer. Mid. Nat. v. 241 (1919). *Liatris ligulistylis* f. *leucantha* Shinnars, Amer. Mid. Nat. xxix. 39 (1943), albino, as was probably *Laciniaria scariosa* f. *globosa* Sheldon, Quart. Bull. Univ. Minn. i. 27 (1892) (this type not seen).

Wisconsin, southern Manitoba, Saskatchewan, and Alberta¹, Minnesota, North and South Dakota, Montana, Wyoming, Colorado, and Northern New Mexico.—WISCONSIN. Co. undetermined: Aug. 1844, *S. B. Mead* (NY). WAUKESHA Co.: Scuppernong Marsh, Aug. 4, 1941, *H. C. Greene* (G). JEFFERSON Co.: C. M. & St. P. Rwy., embankment $\frac{3}{4}$ mi. s. of Palmyra, July 29, 1940, *L. H. Shinnars*, 2429 (G). MANITOBA. (border of Ontario) Rainy Lake & River, *Dr. Richardson*, 9853 (Ot). 62 F s. w.: Camp No. 7, South Antler Creek, Aug. 11, 1873, *G. M. Dawson*, Br. N. A. Boundary Comm. (G). 62 F 9: Souris, Aug. 21, 1889, *T. L. Walker* (Q). 62 G 4: open prairie, n. of Killarney, Aug. 4, 1896, *J. M. Macoun*, 12435 (G, NY, Ot). 62 K 6: Bird-tail Creek, near Birtle, June 26, 1906, *J. M. Macoun* & *W. Herriot* 69884 (NY, Ot, US). 62 I 3: border of marshes, Stoney Mt., Sept. 5, 1884, *J. M. Macoun*, 9855 (Ot). 62 K 1: open prairie, Rapid City, July 25, 1896, *J. M. Macoun*, 12241 (Ot). MINNESOTA. BELTRAMI Co.: Bemidge, July 27, 1925, *L. H. Pammel*, 876 (G). HUBBARD Co.: Benedict, July 31, 1914, *H. J. Bergman*, 2971 (G); Cass Lake, July 29, 1914, *L. H. Pammel* & *H. E. Pammel*, 671 (G); dry sterile sandy opening in jack pine, La Salle Springs, July 2, 1932, *M. F. Buell*, 503 (G); jack pine forest, 11 mis. s. of Hubbard Co. n. border, along Hwy. 71, Aug. 9, 1941, *J. W. Moore* & *D. L. Jacobs*, 15099 (G). CLEAR WATER Co.: north boundary, Itasca Park, Aug. 18, 1929, *M. L. Grant*, 3114 (G, NY, US); dry sandy soil, e. of La Salle Springs, Lake Itasca State Park, Aug. 17, 1918, *C. O. Rosendahl*, 3699 (M, type of *Liatris Rosendahlii* Rydb.). BECKER Co.: brushland, Detroit, Aug. 14, 1914, *Z. L. Chandonnet*, 302 (US). OTTER TAIL Co.: Silver Lake, Aug. 1892, *E. P. Sheldon* (G). HENNEPIN Co.: Minneapolis, Aug. 1878, *C. L. Herrick* (M, type of *Liatris Herrickii* Rydb.). WRIGHT Co.: Cedar Lake, Sept. 1890, *F. L. Holtz* (M 211606 (type of *Laciniaria scariosa* forma *uniflora* Sheldon) and probably 211608 though now lacking head). KANDIYOHI Co.: Whitefield Twsp. Aug. 1, 1892, *W. D. Frost* (US 201918). LINCOLN Co.: Verdi, Aug. 1891, *E. P. Sheldon*, S1364 (M); Lake Benton, Aug. 1891, *E. P. Sheldon*, S1270 (M). NORTH DAKOTA. ROLETTE Co.: in dry soil, open borders of woodland, Turtle Mountains, near St. John, Aug. 30, 1909, *J. Lunell*, 1026 (M, type of *Laciniaria scariosa* var. *perusta*).

¹ Localities in Manitoba, Saskatchewan and Alberta are indicated by standard notation with reference to sheets of the National Topographical Series, Dept. Mines & Resources, Ottawa, Canada.

RAMSEY Co.: in rich prairie soil, Devil's Lake, Aug. 18, 1910, *J. Lunell*, 1021 (M, type of *Laciniaria scariosa* var. *supereminens* Lunell) NY). McHENRY Co.: Towner, Aug. 12, 1908, *J. Lunell* (NY), Aug. 12, 1920, *J. Lunell*, 1016 (M, type of *Laciniaria scariosa* var. *basilaris* Lunell); in rich soil, Towner, Aug. 12, 1908, *J. Lunell*, 1023 (M, type of *Laciniaria scariosa* var. *praestans* Lunell). BENSON Co.: Leeds, Aug. 15, 1908, Aug. 6, 19, 1909, *J. Lunell* (G), Aug. 10, 1907, Aug. 6, 9, 10, 1909, *J. Lunell* (NY), Aug. 29, 1899, Aug. 10, 19, 1909, *J. Lunell* (US), Aug. 19, 1909, Aug. 20, 1915, *J. Lunell* (M); in rich soil, Leeds, Aug. 25, 1914, *J. Lunell*, 1018 (M, type of *Laciniaria scariosa* var. *uniflora* Lunell); dry soil, Leeds, Aug. 13, 1910, *J. Lunell*, 1022 (M, type of *Laciniaria scariosa* var. *praeceps* Lunell); moderately dry soil, Leeds, Aug. 15, 1909, *J. Lunell*, 1025 (M, type of *Laciniaria scariosa* var. *multiplex* Lunell); in rich prairie loam, Leeds, Aug. 27, 1918, *J. Lunell* (M, type of *Laciniaria scariosa* var. *inconcinna* Lunell); in meadowland, along coulee, Leeds, Sept. 8, 1908, *J. Lunell*, 1027 (M, type of *Laciniaria scariosa* var. *angustata* Lunell); in moderately moist, rich soil, Leeds, July 31, 1909, *J. Lunell*, 1028 (M, type of *Laciniaria scariosa* var. *scalaris* Lunell); Leeds, Aug. 19, 1914, *J. Lunell*, 1031 (M, type of *Laciniaria scariosa* var. *insolens* Lunell); in rich meadowland, Leeds, Sept. 6, 1910, *J. Lunell*, 1035 (M, type of *Laciniaria scariosa* var. *opima* Lunell); Leeds, Sept. 9, 1916, *J. Lunell*, 1036 (M, type of *Laciniaria scariosa* var. *annuens* Lunell); Butte, Aug. 9, 1908, Aug. 17, 1909, *J. Lunell* (G, US), Aug. 15, 1914, *J. Lunell* (I), Aug. 26, 1917, *J. Lunell* (M), Aug. 22, 1915, *J. Lunell*, 1019 (M, type of *Laciniaria scariosa* var. *singularis* Lunell), Sept. 3, 1916, *J. Lunell*, 1029 (M, type of *Laciniaria scariosa* var. *immanis* Lunell, July 29, 1906, *J. Lunell*, 1030 (M, type of *Laciniaria scariosa* var. *crista-galli* Lunell), Aug. 15, 1915, *J. Lunell*, 1032 (M, type of *Laciniaria scariosa* var. *composita* Lunell), Aug. 26, 1914, *J. Lunell*, 1034 (M, type of *Laciniaria scariosa* var. *subcorymbosa* Lunell); Butte, Aug. 15, 1915, *J. Lunell*, 1024 (M, type of *Laciniaria scariosa* var. *exuberans* Lunell). KIDDER Co.: Bird Lake, Dawson, Aug. 10, 1917, *F. P. Metcalf*, 261 (US); Deer Lake, Aug. 15, 1917, *F. P. Metcalf*, 296 (US). MORTON Co.: Mandan, Aug. 14, 1927, *E. L. Larson*, 157 (G). SOUTH DAKOTA. Co. undetermined: Black Hills, *Miss Pratt*, 152 (NY). GRANT Co.: virgin prairie, Clear Lake, near Big Stone Lake, Aug. 1, 1940, *P. Johnson*, 69 (G). MEADE Co.: Black Hills near Fort Meade, July 28, 1887, *W. H. Forwood* (US). LAWRENCE Co.: limestone slope, Spearfish Canyon, *H. E. Hayward*, 166 (NY, type of *Liatris Haywardii*, Rydb.); Spearfish, Aug. 5, 1908, *N. F. Petersen*, 2 (US); high open woods, Spearfish Canyon, Aug. 7, 1908, *N. F. Petersen*, 3 (US); Iron Creek, Aug. 7, 1908 (no. 3, 3a¹), Aug. 14, 1908 (no. 3) *N. F. Petersen* (US);

Black Hills, *W. H. Forwood*, 1447 (G); Deadwood to Sturgis Rd., T. 4 N. R. 3 E., Aug. 26, 1910, *J. Murdock*, 4325 (G); high hillsides, Deadwood, July 31, 1913, *W. P. Carr*, 140 (G, NY, US); Deadwood, 1926, *H. E. Hayward*, 263 (NY); Nemo, 1912, *S. S. Visher*, 1560 (NY). CUSTER Co.: Custer, Black Hills (alt. 5500') Aug. 1, 1892, *P. A. Rydberg*, 753 (G, NY, US); Custer, Aug. 21, 1908, *N. F. Petersen*, 4 (US). SASKATCHEWAN. Without stated locality: *Palliser's Br. N. Amer. Exped.*, 1857-8, *E. Bourgeau* (G); Exact region undetermined: open prairies, near Hazel, July 11, 1906, *J. M. Macoun & W. Herriot*, 69885 (NY, US, Ot); prairies, bare hills (G. T. P. Rwy.), July 31, 1906, *J. M. Macoun & W. Herriot*, 69888 (NY, US, Ot); Round Valley Lake (G. T. P. Rwy.), Aug. 7, 1906, *J. M. Macoun & W. Herriot*, 69889 (NY, US, Ot); prairies, 10 mis. w. of Round Valley Lake, Aug. 8, 1906, *J. M. Macoun & W. Herriot*, 69890 (US, Ot); dry gravelly soil, Old Wives Creek, July 25, 1880, *J. M. Macoun*, 72719 (Ot). 72 P 9: 30 mis. s. of Touchwood, July 18, 1906, *J. M. Macoun & W. Herriot*, 69886 (NY, Ot); borders of marshes, Touchwood Hills, Aug. 11, 1872, *J. M. Macoun*, 9856 (Ot). 73 B 2: prairies w. of Saskatoon, July 29, 1906, *J. M. Macoun & W. Herriot*, 69887 (NY, US, Ot); 73 C 12-13: prairies, fresh water lake, e. of Lake Manito, Aug. 8, 1906, *J. M. Macoun & W. Herriot*, 69891 (NY, US, Ot); prairies, Lake Manito (G. T. P. Rwy.), Aug. 9, 1906, *J. M. Macoun & W. Herriot*, 69892 (NY, US, Ot). 73 D 15-16: Ribstone Creek (G. T. P. Rwy.), Aug. 11, 1906, *J. M. Macoun & W. Herriot*, 69893 (NY, US, Ot); prairies, Ribstone Creek (G. T. P. Rwy.), Aug. 11, 1906, *J. M. Macoun & W. Herriot*, 69894 (NY, US, Ot); prairies, Ribstone Creek (G. T. P. Rwy.), Aug. 12, 1906, *J. M. Macoun & W. Herriot*, 69895 (G, NY, US, Ot); prairies, Ribstone Creek (G. T. P. Rwy.), Aug. 14, 1906, *J. M. Macoun & W. Herriot*, 69897 (NY, US, Ot); 73 H 4: sandhills, n. of Prince Albert, July 13, 1896, *J. M. Macoun*, 12749 (Ot); open sandy woodlands, Prince Albert, Aug. 15, 1913, *F. W. Johnson*, 1417 (US). 62 E 5: Weyburn prairie, *A. B. Sanson*, 135 (NY). 62 L 12: Indian Head, Aug. 14, 1895, *W. Spreadborough*, 10830 (Ot). 62 M 1: Yorkton, Aug. 19, 1908, *W. Crawford* (Q). 72 I 6: prairies, Thunder Creek, Moose Jaw, Aug. 27, 1895, *W. Spreadborough*, 10831 (Ot). ALBERTA. 83 H 11: dry prairie, edge of brush, Fort Saskatchewan, Aug. 15, 1935, *G. H. Turner*, 36 (G, NY); prairies, w. side of Beaver Hills, Aug. 23, 1906, *J. M. Macoun & W. Herriot*, 69898 (G, NY, US, Ot). 83 H 12: dry prairies, vicinity of Edmonton, Aug. 3, 1908, *W. C. McCalla*, 2527 (Ot). 83 A 4: prairie, Red Deer, Aug. 1895, *H. M. Gaetz*, 10832 (Ot). MONTANA. SHERIDAN Co.: Westby, Aug. 9, 1928, *Miss E. Larsen*, 204 (US). WYOMING. CROOK Co.: sandy pine woods, 6 mis. n. w. of Hulett, Sept. 14, 1937, *M. Owenby*, 1509

(NY); open woods, Black Hills, July 23, 1910, *A. Nelson*, 9496 (G, NY, US); Devil's Tower, Aug. 9, 1897, *L. W. Carter* (US); Bear Lodge Mts., near Sundance, Aug. 9, 1897, *L. W. Carter* (US). ALBANY Co.: Laramie Peak, Aug. 8, 1895, *A. Nelson*, 1651 (G, NY, US, isotypes); meadows, Bacon's Ranch, Aug. 15, 1903, *A. Nelson*, 8925 (G, NY, US). COLORADO. Co. undetermined: between Arkansas and South Platte River, July 29, 1883, *R. W. Woodward* (G); Coyote Creek, Aug. 29, 1883, *B. H. Smith* (P); Arkansas Valley, *Lieut. Wheeler's Expedition*, 1873, *J. Wolf & J. T. Rothrock*, 458 (G, US); latitude 39-41, 1862, *Hall & Harbour* (G); Colorado Terr. (latitude 39-41), 1864, *C. C. Parry* (O, US). LARIMER Co.: foot of Longs Peak, 1862, *C. C. Parry* (G); Estes Park, Aug. 20, 1864, *C. C. Parry* (G); mountains (alt. 7500'), Aug. 19, 1895, *C. S. Crandall* (NY). ROUTT Co.: Trout Creek, 1873, *J. Wolf*, 458 (NY). ADAMS Co.: Denver, Aug. 1873, *J. M. Coulter* (P, US). ARAPAHOE Co.: South Park, 1871, *W. M. Canby* (G). BOULDER Co.: Sugar Loaf Mt. (alt. 8000'), 1902, *F. Tweedy*, 4935 (NY); JEFFERSON Co.: rocky hillsides, Aug. 30, 1888, *N. G. Smith* (US). MESA Co.: Bridge Pass, 1856, *H. Engelmann* (G). EL PASO Co.: near Manitou, 1899, *Mrs. C. N. S. Horner* (G); Palmer Lake, 1896, *Miss Hughes*, 9 (G). GUNNISON Co.: rich meadows, Parlin (alt. 8000'), Aug. 20, 1901, *B. H. Smith*, 110 (NY, P); Jack's Cabin, region of Gunnison watershed, July 26, 1901, *C. F. Baker*, 610 (NY, US (ND type of *Laciniaria formosa* Greene)); Irwin Lakes, 1896, *F. Clements*, 378 (NY). CUSTER Co.: West Cliffe, 1896, *C. L. Shear*, 3459 (NY). HUERFANO Co.: La Veta, 1896, *C. L. Shear*, 3561 (NY). ALAMOSA Co.: Alamosa, 1896, *F. Clements* 122 (NY). ARCHULETA Co.: Pagosa Springs, Aug. 19, 1893, *B. H. Smith* (P), Aug. 30, 1899, *C. F. Baker*, 691 (G, NY, US); grassy meadow near Dyke, Aug. 11, 1937, *Marion Ownbey*, 1430 (NY). NEW MEXICO. Co. undetermined: Sierra Grande, Aug. 15, 1903, *A. H. Howell*, 212 (US). COLFAX Co.: marshy hillside, vicinity of Ute Park, (alt. 2200-2900 m.), Sept. 6, 1916, *P. C. Standley*, 14397 (G, NY, US); clay & shale in oak-pine woods, top of Raton Pass (alt. 7800'), Aug. 6, 1941, *U. T. Waterfall*, 3186 (G). SAN MIGUEL Co.: Rociada, 1905, *J. E. Dandelin* (G).

The description of *Laciniaria ligulistylis* differentiated this species clearly from other western ones. However, since Nelson described the leaves as being glabrous, subsequent writers in referring to plants of the northern mid-west region have distinguished from this species similar plants that had pubescent leaves, as Rydberg in *L. Rosendahlia* and Lunell in the numerous varieties of *Laciniaria scariosa* cited above: When describing

the plants of that species from North Dakota, Lunell (Amer. Mid. Nat. ii. 90 (1911)) stated generally: "The leaves . . . sometimes glabrate, but never perfectly glabrous" and again: "The Rocky Mountain forms as described by Prof. Aven Nelson (*Liatris ligulistylis*) are single-stemmed with glabrous leaves, else they appear in general characters to be near relatives of our plants". Dr. Nelson has kindly examined for the writer specimens received from Saskatchewan of which the leaves had not only a ciliate margin but also some pubescence. These he identified as *L. ligulistylis* and in correspondence he stated: "I find that I have placed three of Lunell's specimens under *L. ligulistylis*. He distributed them as varieties of *L. scariosa*. I am wondering if these three may not have been included in Dr. Rydberg's *L. Rosendahlia*. I see no sufficient reason for keeping of any of these out of *L. ligulistylis*". The discovery that the corolla-tube of *Liatris ligulistylis* lacks any pilosity within, as does the type specimen of *L. Rosendahlia* Rydb. (*C. O. Rosendahl*, no. 3699, Itasca State Park, Minn. (M)) has given a fine test-character to accompany determinations, especially as all other members of the *Scariosae* series do have hairs in the corolla-tube near the base of the filaments.

Examination of the type specimens of Lunell's varieties of *Laciniaria scariosa* kindly loaned me by Prof. Rosendahl of the University of Minnesota, has made it seem advisable to add to the synonymy of *L. ligulistylis* many of those varieties. Most of them were based on variations of leaf-shape and -arrangement, but excepting the character of pubescent leaves, were said by Lunell to be "near relatives" of *L. ligulistylis*. On examination of the corolla-tubes, 19 of the type specimens of Lunell's varieties from North Dakota and Minnesota were found to have no hairs within, and by other leaf-, head- and phyllary-characters to fall correctly under *L. ligulistylis*. These are found in the list of synonyms. Eight of the others (varieties *brachiata*, *Chandonnetii*, *nictitans*, *praecellens*, *propinqua*, *ramea*, *superans* and *superscandens*) showed some pilosity and other characters giving evidence that they are intermediates between this species and *L. aspera*.

Although the type specimen of Sheldon's *Laciniaria scariosa* var. *corymbulosa* (*Leiberg*, no. 27 from Mankato, Blue Earth Co., Minn. (M)) has unfortunately not been located, from the splendid

plate given of it (Bull. Geol. & Nat. Hist. Surv. Minn. ix. 77. t. 6 (1894)) when raising it from formal to varietal rank, and from the examination of two of three specimens then cited (Aug. 1891, *E. P. Sheldon*, nos. 1270 and 1364 from Lakes Benton and Verdi respectively, Lincoln Co., Minn. (M)) which proved to be *L. ligulistylis* (Nels.) K. Sch., we are here including it in the synonymy of that species. However, one specimen cited (Aug. 1891, *E. P. Sheldon*, no. 1586 from Lake Benton, Lincoln Co., Minn. (M)) proved to be an intermediate, as are the specimens of Aug. 16, 1901, *L. R. Waldron* and *T. F. Manns* from the vicinity of Fargo, N. Dak. (G, US). Successful hybridization between these two species has resulted in a wide variety of combinations of parental characters too inconstant to be typified in one hybrid description, yet easily recognizable (see no. 18).

In the description of *Liatris Haywardii* Rydb. (*Brittonia* i. 99 (1931)) from South Dakota there seems to be a close parallelism to *L. Rosendahlia* and *L. ligulistylis* in the size of the corm, leaves, bracts, achene and pappus. The outer phyllaries were described as elliptical and erose on the margin and the inner ones oblong. Rydberg has stated that it differed from *L. aspera* "in the big heads often 2 cm. broad, and in the outer bracts which are twice as long as broad". Examination of the type specimen (*H. E. Hayward*, no. 166, Spearfish Canyon, Lawrence Co., South Dakota, (NY)) showed that the leaves were hirsute on the upper and lower surfaces, and the long phyllaries were loose and erect, as in the involucre of *L. ligulistylis*. By comparison of the flowers it was found that Hayward's plant, as well as that of Miss Pratt (no. 153, from the Black Hills, South Dakota (NY)), also mentioned by Rydberg, lacked pilosity inside the corolla-tube and this gave further confirmation of the relationship to *L. ligulistylis*. Thus again, as in *L. aspera* (see no. 18), there seems to be a range of plants varying in all degrees of pubescence from glabrous to quite hirsute, but always roughened by the cilia on the margin and without any clear-cut geographical limits, so that they can hardly be sharply separated into two varieties, as in that species, and it has seemed best to place them all under one species, *L. ligulistylis*. Sometimes plants are less robust and the heads do not acquire the usual size or there are other features of aberrancy. Such a specimen was described as *Liatris Herrickii* Rydb. (*Brittonia*, i. 99 (1931)).

An interspecific hybrid of *L. ligulistylis* and *L. punctata*, × *L. fallacior* (Lunell) Rydb., will be discussed under *L. punctata* (see no. 24) but one of less certain parentage is here included.

× **LIATRIS Nieuwlandii** (Lunell), stat. nov. Stems stiff, 6–10 dm. tall, glabrous or sparingly pubescent below and quite pubescent above or densely pubescent throughout; leaves sometimes glabrous or quite pubescent on lower surface and sparingly so above, usually with a rough margin; basal ones broadly lanceolate, 8–10 cm. long, gradually reduced upwards: inflorescence of few (9–20), sometimes of more numerous, large, sessile or pedicellate heads of 40–70 flowers; phyllaries erect, herbaceous, somewhat cinereous, mostly green to the margins though sometimes quite purplish in color, broadly obovate or somewhat spatulate, almost non-petaloid or with but narrow petaloid or finely ciliolate margins; corolla 9–11 mm. long, generally non-pilose within the tube, though sometimes with scattered hairs; pappus 8–10 mm. long; achene 5–6 mm. long.—*Laciniaria scariosa* var. *Nieuwlandii* Lunell (including f. *versicolor*, f. *gracillima* and f. *borealis* (= f. *septentrionalis* *ibid.* p. 264)) and var. *praesignis* Lunell, Amer. Mid. Nat. ii. 169–177 (1912). *Liatris novaeangliae* var. *Nieuwlandii* (Lunell) Shinnars, Amer. Mid. Nat. xxix. 31 (1943) including f. *alba* Shinnars, *ibid.*

From Michigan and Wisconsin southward into Ohio, Indiana, Illinois and Missouri.—MICHIGAN. Without stated locality: *Dr. Crossman* (G). CRAWFORD Co.: sandy jack-pine plains, 6¾ mis. n. n. w. of Grayling, Sept. 14, 1935, *F. J. Hermann*, 7324 (US); vicinity of Grayling, July 122, *C. V. Piper* (US). GRAND TRAVERSE Co.: Boardman Plains, Sept. 2, 1919, *W. L. McAtee*, 3114 (US). LAPEER Co.: s. side of Lapeer, Aug. 17, 1911, *C. K. Dodge* (US 690400-1-2). INGHAM Co.: college grounds, Agric. College, Sept. 20, 1890, *C. F. Wheeler* (US 63528). WAYNE Co. 7 Mile Road, Detroit, Nov. 13, 1911, *J. A. Nieuwland*, 1680 (ND type of *Laciniaria scariosa* (L.) Hill var. *Nieuwlandii* f. *septentrionalis* Lunell). WASHTENAW Co.: Ypsilanti, Sept. 26, 1857, *W. Boott* (G); steep grassy bank, 2.3 mis. n. e. of Ann Arbor, Sept. 5, 1937, *E. J. Hermann*, 9196 (NY). OHIO. ERIE Co.: Castalia Prairie, Sept. 19, 1909, *E. L. Moseley* (US), LUCAS Co.: near Toledo, Aug. 1879, *J. A. Sanford*, 1176 (NY). STARK Co.: Canton South Swamp, Sept. 1, 1912, *Mrs. Case* (G). FRANKLIN Co.: Columbus, *W. S.*, 64 (G). INDIANA. STEUBEN Co.: in a prairie condition, ½ mi. n. of Clear Lake, Aug. 21, 1904, *C. C. Deam* (M, type of *Laciniaria scariosa* (L.) Hill var. *Nieuwlandii* f. *versicolor* Lunell) ((G, 12 sheets) NY); Sept. 11, 1904 (M, type of *Laciniaria scariosa* (L.) Hill var. *Nieuwlandii* f. *gracillima* Lunell) ((G, 2 sheets) NY); without stated locality, Aug. 21, 1904, *C. C. Deam* (US 494351); in sandy woods, near

Cedar Lake, Sept. 9, 1903, *C. C. Deam* (US 440343); without stated locality, Sept. 11, 1904, *C. C. Deam* (US 494350); gravelly roadside, on the e. side of Tamarack Lake, Aug. 19, 1916, *C. C. Deam*, 20918 (US); n. e. of Clear Lake, Aug. 18, 1916, *C. C. Deam*, 20900 (US); e. of Hog Bog Lake, *C. C. Deam*, 20934 (US). LA GRANGE Co.: on high bank of Pigeon R., 2 mis. e. of Ontario, Aug. 30, 1914, *C. C. Deam*, 15075 (US). PORTER Co.: sandy soil along Erie Rwy. just w. of Kouts, Sept. 12, 1942, *R. C. Friesner*, 17471 (G). NOBLE Co.: dry white-black oak woods, 1½ mis. s. w. of Rome City, Aug. 26, 1914, *C. C. Deam*, 14776 (G, US). KOSCIUSKO Co.: in a gravel pit, n. side of Winona Assembly Grounds, Aug. 17, 1906, *C. C. Deam*, 1496 (G); in sandy woods, w. side of Pike Lake, near Warsaw, Aug. 17, 1906, *C. C. Deam*, 1524 (NY, US); w. side of Pike Lake, Sept. 16, 1906, *C. C. Deam* (US). MARSHALL Co.: outlet of Lake Maxinkuckee, Sept. 5, 1909, *H. W. Clark* (US). ALLEN Co.: prairie, ¾ mi. s. of Fort Wayne, Aug. 19, 1900, *C. C. Deam* (M, type of *Laciniaria scariosa* (L.) Hill var. *Nieuwlandii* Lunell). CASS Co.: sandy prairie patches along rwy. ½ mi. e. of L. Cicott, Sept. 26, 1936, *R. Friesner*, 10136 (NY). WARREN Co.: stone bluffs of Pine Creek, 2 mis. above Mudlavia, Sept. 11, 1911, *C. C. Deam*, 9986 (M, type of *Laciniaria scariosa* (L.) Hill var. *praesignis* Lunell). WISCONSIN. WALWORTH Co.: Lauderdale Lakes, Aug. 1890. *M. S. Bebb* (G): without stated locality, 1872, *M. S. Bebb* (US). Rock Co.: oak openings along the Chicago N. W. Rwy., Clinton, Sept. 1, 1909, *E. S. Steele*, 97a (G, US) 97b (G, US) 97c, 97d (US). ILLINOIS. COOK Co.: pebbly clay of Valparaiso moraine, vicinity of Palos Park, Sept. 6-7, 1909, *E. S. Steele*, 134a (G) 135 (G, US) 135c (G, US); dry hills, Palos Park, Sept. 6, 1900, *L. M. Umbach* (US); thickets, Palos Park, Sept. 17, 1907, *L. M. Umbach*, 2119 (US). HANCOCK Co.: Augusta, Aug. 1844, *S. B. Mead* (NY). MENARD Co.: without stated locality, Aug. 1872, *M. M. Milligan* (US). MISSOURI. PIKE Co.: McCune, Aug. 28, 1915, *J. Davis*, 249 (US).

(To be continued)

A SECOND STATION FOR CORYDALIS FLAVULA IN CONNECTICUT.—*Corydalis flavula* (syn. *Capnoides flavulum*) is not recorded in Gray's Manual, 7th Edition, or in Britton & Brown's Illustrated Flora, 2nd Edition, as found in New England. In 1925 Mr. Hugh S. Clark of Lancaster, Massachusetts, then a student at Wesleyan, found the plant on a stony ledge on Higby Mountain, a trap ridge in the western part of Middletown and Middlefield, Connecticut. He recorded the find in a note published in